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Engineering Library

AMERICAN ARTISAN and Hardware Record

Vol. 87. No. 2. 620 SOUTH MICHIGAN AVENUE, CHICAGO, JANUARY 12, 1924. $2.00 Per Year.

THATCHER *Furnaces*

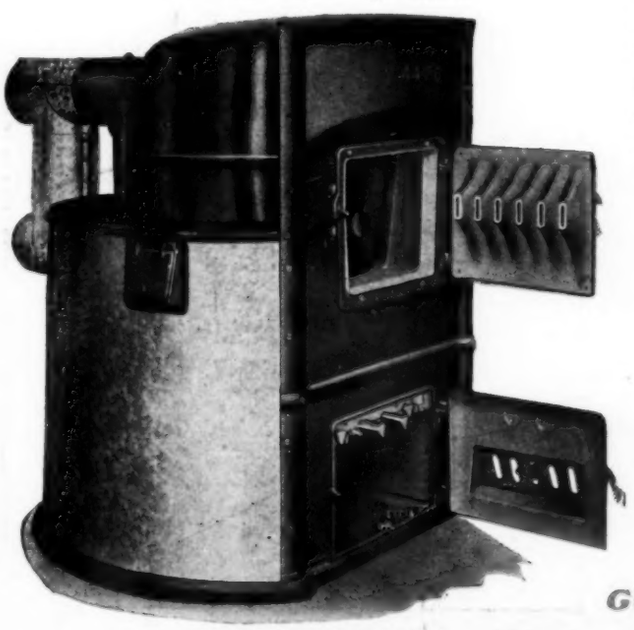
Cold Facts about the Thatcher Agency—

OPEN territories this year are getting scarce—the 1924 Thatcher agency is being sought for by progressive dealers. They have learned more about Thatcher's 72 years of leadership in the warm air heating industry, the Thatcher policy of building only high quality guaranteed furnaces, Thatcher continuous, complete dealer service and Thatcher conservative prices.

A Thatcher district representative is on the road and in your territory now—if you are looking for a real money making proposition and a permanent, sound furnace business connection, *write* or *wire today* to have him call on you.

When you become a Thatcher dealer you begin to make real profits in the furnace business because that's the kind of dealers we want.

Write or wire for complete catalogs and agency details Right Now



THATCHER SMOKELESS

The THATCHER Complete Line of High Grade Furnaces

THATCHER SMOKELESS

THATCHER TUBULAR

THATCHER NEW METEOR

THATCHER NEW PACIFIC

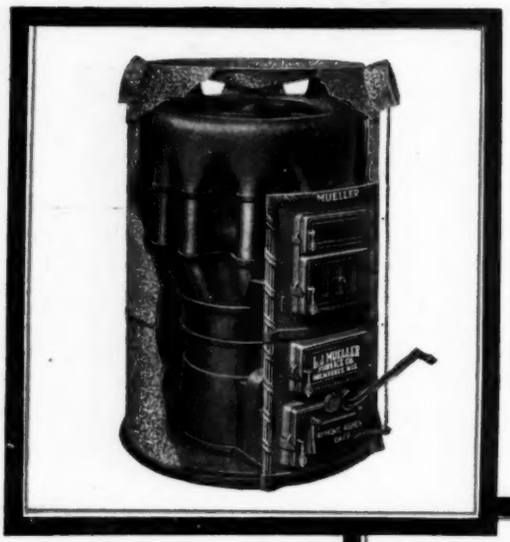
THATCHER PIPELESS

EVERY ONE GUARANTEED

THATCHER NEW METEOR

THATCHER FURNACE CO., 341 N. Clark Street, CHICAGO, ILL.
133-135 W. 35th St., NEW YORK, N. Y.
39-41 St. Francis Street, NEWARK, N. J.

Own a business, not a "shop"



THE great Mueller factories grew from a Milwaukee shop. The high quality that was built into the first Mueller Furnace, coupled with aggressive and advanced merchandising methods, was responsible for that growth. And no matter what the size of your shop today, its possibilities are no less great, because the same product and the same methods are now within *your grasp.*

The way to permanent prosperity in the furnace business is the Mueller Agency. With it you can secure the exclusive selling rights in your territory for an unequalled furnace. You will have powerful help from an energetic advertising department. An engineering service unapproached in completness aids you in making every installation properly. And a clean-cut, simple, easy payment plan assures you of getting every dollar's worth of business your territory affords.

A letter for details will unlock the door to bigger profits—turn the key today.

The Mueller Double Radiator Pipe Furnace shown above, is self-cleaning, and has more direct heating surface than any other. The Mueller Convector (The Heating System without Pipes) has oversize duplex register, larger air passages and greater heating surface—compelling arguments that make sales.

The letter reproduced at the right is the answer to the question, "What will the Mueller Agency do for me?" If you would like to be able to write the same kind of letter, let us send you facts that will point the way.

LOUIS E. SCHAEDE
..Sheet Metal and Furnace Work...
5517 SO. HALSTED STREET
CHICAGO, ILL.

Furnaces
Roofing
Safety Guards
Welding

L. J. Mueller Furnace Company,
Milwaukee, Wisconsin.

Gentlemen:

When your representative called upon me and explained your merchandising plan, I could not see any other way than to accept proposition.

I had never been offered such a plan where the dealer received as much benefit.

During the three months, my sales have more than doubled. I give credit for same to your advertising and exceptional assistance of your sales force.

Your easy payment plan has enabled me to make quick turnover and more sales.

I am very enthusiastic about being considered a Mueller Franchise Dealer.

Yours very truly,

Louis E. Schaede

MUELLER FURNACES

— dependable heat —

L. J. MUELLER FURNACE COMPANY

Makers of Warm Air, Steam, Vapor and Hot Water Heating Systems, Garage Heaters, etc.

193 Reed Street Milwaukee, Wisconsin

easier to sell than to sell against

Founded 1880 by Daniel Stern

Thoroughly Covers the Warm Air Furnace Sheet Metal, Stove and Hardware Interests

AMERICAN ARTISAN and Hardware Record

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AN INVITATION

AMERICAN ARTISAN courteously invites and urges you to participate in the privileges and benefits of its Service Department. Any phase of the warm air heating and sheet metal industries or stove sales and window display questions may be profitably and instructively discussed in this department. If your problem is a knotty or technical one, submit it to the Service Department and secure the benefits of the opinions of other men. It is an exchange information department, and you are asked to relate your accomplishments and tell how you have surmounted difficulties. Wherever possible rough sketches or photographs should accompany the questions or suggestions, as they always make clear the points involved. Use this Service Department freely; it is yours.

ALPHABETICAL INDEX AND CLASSIFIED LIST OF ADVERTISERS, Pages 44-46-48

A Mighty Selling Institution Where Buying is Contagious

AMERICA'S BUSINESS INCUBATOR

World's Famous Hardware Show

Conducted by

PENNSYLVANIA & ATLANTIC SEABOARD HARDWARE ASSOCIATION, INC.

Supported by Over 400 Manufacturers and Jobbers

Attracting Buyers From Every Quarter
Over 4000 Merchants Attending
The Place to Make New Customers

Sales Recorded 1923 Show $2,093,000.00

Most Popular Exhibition in America

HELD ANNUALLY AT PHILADELPHIA
IN THE GREAT COMMERCIAL MUSEUM

Date--February 12, 13, 14, 15, 1924

For Information Write
SHARON E. JONES, Sec'y, 604 Wesley Building, Philadelphia

Is the Warm Air Furnace Industry Ready for an Efficient Campaign of Education Among Consumers and Installers?

AT the annual meeting of Western Warm Air Furnace and Supply Association, F. L. Sedgwick gave the results of an investigation he had made during the Fall months of last year among warm air furnace installers by letters and questionnaires.

One of the questions asked had reference to the National Code Regulating the Installation of Warm Air Furnaces in Residences—viz.: "Do you figure your jobs according to the National Code?"

Some of the replies indicated that the installer did not think it possible to secure business if his bids were based on the Code.

Another question was, "Do you think that you make a sufficient margin of profit in your business?"

More than half of those who replied stated it as their opinion that the profit was not as large as it ought to be.

A third question was, "If furnace competition in your city is such as to make profitable sales difficult or impossible, do you think that a campaign of education backed by the manufacturers and jobbers would improve the situation?"

By far, the great majority of replies was in favor of such a campaign, and an interesting feature in this connection was that the desire for the campaign was stronger in the larger cities, where competition naturally is more marked.

With these facts in mind, let us consider wha tthe replies really mean.

First—Some installers actually feel that they cannot secure business if they are to figure jobs on the basis of the National Code. Code.

What does this mean?

Is the Code so far out of the way in its rules that its enforcement entails needless cost to the home owner?

Not at all. The Code is rather the minimum safety guide for a safe, reliable job. Its standards if anything are below what some heating engineers regard as the safety line.

So this situation certainly calls for some way of bringing the building contractor, the architect and the home buyer or owner to the point where he will realize the fallacy of buying a furnace job purely on the basis of the lowest price.

Secondly—Most of the installers feel that their profits are too small.

Who is to blame for this?

The installers—both the class which figures too low to begin with and the class which quotes a still lower price, because "If Mr. Competitor can do the work for $150.00, I can do it for $145.00."

This certainly calls for some considerable campaign of education among the installers, for profits will never reach a reasonably satisfactory point until the great majority of installers are brought to a realization that decent work is the only basis upon which their success can be built, and that decent work can always be sold at a fair profit.

Thirdly—The installers are in a mood to cooperate with an educational campaign?

Those who have passed the point where they are not mere day laborers even if "being in business for themselves," are anxious to help bring the furnace business up to the high standard where it belongs.

The most important question for the Committee on Publicity and Trade Practices and the sub-committee which was appointed at the recent Urbana meeting is, therefore, rather the question of how to raise the money for this educational campaign than the question as to whether such a campaign is necessary and practical.

The campaign is necessary. The money must be raised. Messrs. D. Rait Richardson, E. F. Glore and G. L. Bridge have a big job on their hands, but they are the sort of men who tackle big jobs and put them through.

Random Notes and Sketches.

By Sidney Arnold

A Chinese editor enclosed a rejection slip, when returning contributions, which read as follows: "We have read your manuscript with infinite delight. Never before have we reveled in such a masterpiece. If we printed it the authorities would take it for a model and henceforth would never permit anything inferior to it. As it would be impossible to find its equal within 10,000 years, we are compelled, though shaken with sorrow, to return your divine manuscript, and for so doing we beg 10,000 pardons."

* * *

We can not preserve the leadership of this nation in business and industry if there creeps in amongst us the deadly social fallacy that, in a great world, with its myriad human needs and aspirations, there is only so much work to be done, and that by limiting the amount of work each worker may do, the work will furnish more wages to be paid, and therefore there will be more employment and earnings. Every chapter of American history disproves that as the greatest social fallacy and social injury in the world. The employers of America are not blameless in that they do not make this industrial philosophy and its human service clear to the world, and that they do not cushion the impact on the individual worker which accompanies the enlargement of production by labor-saving machinery. How can you expect a worker to enthuse over the bare economics of such a situation when, for instance, the magnetic crane comes into play and two men perform the work of a hundred and thirty, and if then a hundred and twenty-eight are told to seek other jobs? But when they see that they do find other positions, that opportunity for employment grows by this very process, that it is only the question of the individual impact being cushioned until the worker finds himself almost inevitably in a better position, then the employers of America can secure the cordial coöperation of the workers in what is in reality a great economic advance securing an acceleration of human progress. —*Julius H. Barnes.*

* * *

Fred Ehret, of the Oakland Foundry Company, had lunch in a St. Louis restaurant one day and as his appetite was good, he ordered chicken stew with dumplings and all the other trimmings.

Noting that he was "picking" at the stuff on his platter, the waiter asked, "Is there something the matter with your chicken, sir?"

Fred looked at him, looked at the platter and replied: "No, nothing much, except that this chicken must have been a freak. I don't remember ever having seen a chicken before that consisted of two backs, three necks, a gizzard and a wing."

* * *

When a lawyer makes a mistake, it is just what he wanted, because he has a chance to try the case all over again.

When a doctor makes a mistake, he buries it.

When a judge makes a mistake, it becomes the law of the land.

When a preacher makes a mistake, nobody knows the difference.

When an electrician makes a mistake, he blames it on induction, and nobody knows what that means.

When a printer makes a mistake, he gets the "devil."

But when the editor makes a mistake, hell is to pay.

* * *

Some of my friends in the furnace manufacturing business evidently are under the impression that I am as prosperous as they have been during the past year, judging from the remembrances that I received from them this Christmas. Several of them sent me things for my desk, such as blotters, fountain pens, letter openers, etc. The letter openers come in very handy, but an editorial writer uses ink only for the signing of letters, it being a rare occasion when he even carries a check book, so the patent blotting stone that I received from Roy Walker, of the Meyer Furnace Company, is going to be exchanged next time I see him for a box of cigars or something equally useful. Thanks, however, for the kind thought, Roy.

* * *

I don't know who Thomas W. Griffith is, but he said a mouthful when he put this together:

The hammer is a knocker, but it is a constructive one. Its knocking seldom injures anyone.

Its work is a continuous drive; yet it never solicits subscriptions.

It sometimes possesses pull, but it does not depend on that entirely for its results.

Frequently it gets down to brass tacks.

When it sees an opportunity, it usually nails it.

It goes right to the point.

It strikes home.

Emulate the hammer!

* * *

If I Knew You and You Knew Me.

If I knew you and you knew me,
'Tis seldom we would disagree;
But, never having yet clasped hands,
Both often fail to understand
That each intends to do what's right
And treat each other "honor bright."
How little to complain there'd be
If I knew you and you knew me.

Whenever we ship you by mistake,
Or in your bill some error make,
From irritation you'd be free
If I knew you and you knew me.
Or when the checks don't come on time,
And customers send nary a line,
We'd wait without anxiety
If I knew you and you knew me.

Or when some goods you "fire back,"
Or make a "kick" on this or that,
We'd take it in good part you see,
If I knew you and you knew me.
With customers a million strong
Occasionally things go wrong—
Sometimes our fault, sometimes theirs—
Forbearance would decrease all cares;
Kind friend, how pleasant things would be
If I knew you and you knew me.

Then let no doubting thoughts abide
Of firm good faith on either side;
Confidence to each other give,
Living ourselves, let others live;
But any time you come this way,
That you will call we hope and pray;
Then face to face ye each shall see
And I'll know you and you'll know me.

—*Niagara Falls S. & R. Corp.*

Millis Explains British Thermal Unit and Shows How Devices for Measuring Heat Were Developed.

Measures Temperature of Red Hot Fire With Aid of Iron, Water and Knowledge of "Specific Heat" Without Burning His Fingers

IN OUR issue of December 1, 1923, L. W. Millis, Kansas City, Missouri, gave an excellent discourse on the fundamentals of radiant and convected heat. He also showed us how heat gets to us from the sun.

The following article has progressed to the next step in considering heat and dwells upon its measurement:

Measurement of Heat.

Now that we have learned something about heat, I think it is a good idea to know something about the terms used when talking about it, such as degrees, units, and specific heat.

Of course, everybody knows that a thermometer indicates degrees of temperature, but it does not tell us how much heat a thing has in it.

We know that it takes more heat to raise a 50-gallon tank of water to 100 degrees than it does to bring a tea kettle full to 212 degrees, and maybe it takes more, and maybe it takes less to raise a 1,000-pound furnace only ten degrees, or a room of 3,000 cubic feet capacity to 70 degrees.

Structure of Galileo's Thermometer.

Before we go into that, I believe it would be interesting, though not of immediate value, to look up the history of the thermometer.

The first practical thermometer was made prior to 1597 by Galileo, 1564-1642. It consisted of a sealed glass tube with a bulb containing some colored water, also some air. The tube was arranged so that the increase in pressure of the air when it was warmed would force the colored water up into the tube.

At that time there was no method of stating temperature. If the air rose some in the tube, it indicated some increase in temperature. If it rose a right smart amount more, it was a blamed sight hotter. It was about as accurate as the little toys sold now to indicate weather changes.

Fahrenheit Thinks He Produced Coldest Temperature.

The next point of interest is the present thermometer named after its designer, Fahrenheit. He was living in Dantzic and he thought he knew exactly what the coldest temperature was. He had been in it himself and he also thought he knew how to reproduce it in his laboratory by mixing broken ice and salt. He believed that nature out of doors and man in his laboratory could go no lower, so he immersed his mercury tube in a mixture of ice and salt and marked it zero, and believed it to be absolute zero.

He next calculated that the volume of the mercury was 11/124 parts. Next, he put the tube in a mixture of water and ice. The mercury rose in the tube. He calculated the volume of the mercury and found it to be 11.156, or an increase of 32 parts, so he scratched 32 on the tube and called it the freezing point of water. He then inserted the tube in boiling water. The mercury expanded to 11.336 parts, or 212 degrees above his zero. He divided the space between 32 and 212 into 180 parts or degrees, and these rather cumbersome figures have stood from that day until now as the best thermometer scale.

You have probably noticed how far wrong Fahrenheit was in his conception of absolute zero. Mercury has its limitations, as it freezes at about 40 degrees below and boils at about 674 degrees above zero.

True Temperature and Fahrenheit Table.

If it were possible to make a universal thermometer, it would indicate a range of effects something like this, and if written in correct temperature from absolute zero, the table would be a continuously rising scale, with freezing water reading at its true temperature, 491 degrees *hot*, counting from absolute zero:

I think that perhaps we should not have had the conflicting ideas of heat and cold being opposite things if we had always thought of the only absolutely cold thing as being at true absolute zero and every other temperature as being something warmer. If we were accustomed to the figures, it would be just as easy to say the thermometer reads 529 degrees in this room as to say it reads 70 degrees, and it would be a more accurate statement.

There are many other methods of measuring temperatures, but the furnace man is not largly interested in them.

Heat Capacities of Different Substances Varies.

Different substances have varying capacities for heat. That is, two substances may register 100 degrees temperature each, but one may have enough heat in quantity to raise a pound of water to a greater temperature than the other. The *amount* of heat a thing can contain as compared with the same weight of water is called "Specific heat."

Water is rated as 1.

This little table gives an idea of the specific heat in various substances:

Water	1.
Copper	.0951
Cold cast iron	.1298
Hot cast iron	.1800
Gold	.0324
Silver	.0570
Ice	.5040

You will notice that a pound of ice can only contain half as much heat as a pound of water. A pound of gold only .03 as much, but a pound of silver will contain nearly twice as much as a pound of gold.

You will notice that I have spoken of amount of heat, and quantity of heat, but have not used a name or term that would indicate how the quantity is measured, such as a quart, or a pound, or a foot of heat.

How the B. T. U. Is Arrived At.

After a method of describing the temperature of a thing was created

True Temperature.	Fahrenheit.		
16259	15800	Degrees	Temperature of sun
9819	9360	"	Highest reached by man
6759	6300	"	Carbon boils
5259	4800	"	Asmium boils
4271	3812	"	Copper boils
3959	3500	"	Steel boils
3715	3256	"	Platinum melts
1674	1215	"	Aluminum melts
1219	760	"	Water under 3,200 pounds pressure changes to steam *without latent heat*
671	212	"	Water boils
529	70	"	Comfort zone
491	32	"	Water freezes
459	0	"	
419	40	"	Mercury freezes
299	162	"	Air liquifies
259	202	"	Alcohol freezes
159	300	"	Oxygen boils
36	423	"	Liquid hydrogen
26	433	"	Lowest recorded temperature
11	448	"	Estimated by expanding helium at 433 degrees
0	459	"	Absolute zero

and it was found that various things held different *quantities* of heat, it became necessary to find some way of measuring the quantity. So, it has been agreed in English-speaking countries that the quantity of heat required to raise one pound of water from 62 degrees to 63 degrees Fahrenheit or, as generally stated, the amount of heat required to raise one pound of water to one degree shall be the unit of measurement, and is called a British thermal unit, and is abbreviated B. t. u.

Probably no simple term in commercial use has caused more consternation or more dodging among conscientious furnace men than this extremely simple B. t. u.

I may also say that the efforts of illiterate "Heatin' Ingineers," to use the term, has occasioned much merriment, at least it would be humorous were it not for the fact that the public are, of course, liable to be duped by fellows trying to "highbrow" the people.

I have in my desk a number of such catalogs and circulars. One man says his device "Consumes all the heat units in the fuel." I suppose if he had a meat chopper, he might claim that it chopped all the pounds in the meat.

Let us go back just a minute to that specific heat "stuff." If one pound of water absorbs one B. t. u., then one pound of gold would absorb .03 B. t. u and copper .09; in other words, statements of specific heat mean that a pound of a substance will absorb some stated portion of a B. t. u., while a pound of water absorbs one B. t. u.

Culling Measures Heat of Fire Without Burning Fingers.

Mr. Culling "monkeys" with more heat than most of us, and has arranged to give us a little demonstration of the relation of heat units, specific heat, and degrees of heat or temperature.

You notcie he has three-fourths pound of iron in the fire in the furnace. The iron is as hot as the fire in the furnace. We want to know how hot that fire is.

He has ten pounds of water in that pail, which you notice is well insulated on the outside. The temperature of the water is 60 degrees. All right, Mr. Culling, drop the hot iron in the water and let it remain until the iron is lowered to the same temperature as the water. Cover it up so it does not lose much heat. Now, we find that the water is 85 degrees.

Just a moment ago we had ten pounds of water at 60 degrees and three-fourths pound of iron at some unknown temperature, but we know the specific heat or the capacity of each. So let's "figger" a little. The water was 60 degrees and we raised it 25 degrees, or to 85 degrees.

There is three-fourths pound of iron and it has a capacity of .18 of a B. t. u. per pound for each *degree* of rise in temperature. Therefore, ten pounds times 25 degrees rise, divided by three-fourths of a pound, times .18 "Specific heat" gives 1,926 degrees. As the water already had 60 degrees, we have a final temperature of 1,986 degrees as the temperature of the iron. As the temperature of the iron was the same as the fire, we can assume that the fire was 1,986 degrees in temperature.

This little example shows us the relation of degrees, specific heat, and quantity or B. t. u. I think we won't run now when we meet those B. t. u., but will treat them as if we had known them always.

Really, it is rather wonderful that men should have devised a method of measuring a thing that only exists as an evidence of molecular action, so that it may be bought, and carried from place to place and know exactly how much of it we are handling. You know heat is a form of energy.

Table of Comparisons.

Most of you probably know some unit of energy that gives you a comprehension of size, so I have a table of comparisons in which one B. t. u. is equal to the following values:

1	pound water raised from 62 degrees to 63 degrees
1	cubic foot air raised 55 degrees
55	cubic feet air raised 1 degree
1.055	watt seconds
778	foot pounds
107.6	kilogram meters
.000293	kilowatt hours
.000393	horse power hours
.0000688	pounds carbon oxidized
.000043	ounces carbon oxidized
.001063	pounds evaporated at 212 degrees
.252	calories

A square foot of glass will allow about one to one and one-fifth B. t. u. to pass through it when the air is one degree warmer on one side than it is on the other. A

wooden wall of rather good construction, for example, siding over boxing with paper between, and the inside lathed and plastered, will lose about one-fifth of a B. t. u. per square foot for each degree difference between the inside and the outside.

Practically everything used as building material has been tested to find how much heat will pass through it and also a method of ascertaining how much heat will pass through every possible combination of materials, so that it is possible to calculate any and every requirement.

I hope this will give you an idea of the terms used in speaking of heat. At nearly all of our meetings we take the idea we get to the basement and apply it to our daily work. The success with which we apply any idea depends on three qualities of the individual; namely, first, a thorough comprehension of the idea; secondly, sufficient skill to change the idea into a real thing; finally, character to give quality to the thing done.

"Duties" of "Secretary of Combustion."

You have seen respectable looking houses that had a basement in keeping with the house, and you have seen them with basements that were a disgrace to the house. I think of men in the same way. Most men are fair looking men; they have ideas and they are able to do certain things, but like the house, you must go away down into the inside of a man to find his character.

Now, we are going to try to apply this to our own basements, or in other words, our own characters. As children say, let us play that in the President's cabinet there is a secretary of heat or maybe he would be called a secretary of combustion, which, of course, includes explosives, and that you were selected for that post. That's right, laugh! But there have been less capable men in such positions than some of you fellows.

Here is a sheet of paper, I will give you five minutes to write down what you think is the most vital thing for such an official to accomplish. Leave your name off, if you want to.

All right, your papers seem to divide into several classes. There is only one paper in one of the classes. The writer says he would urge a commission to develop the explosive section of combustion and heat in order that weapons of offense (note the word, offense) should be available to make other nations do our bidding. I expect that the basement of that man's character contains a lot of bulldozing. I would wager his furnace work is tainted with the "get by" idea and that he is imbued with the idea of "*making* them like it."

Here are five papers that more or less insist they would have the government regulate wastage of fuel. Well, that is the modern governmental idea, all right. Here are thirty-four papers that fall into another class. They would establish bureaus to educate people, who use heat in any form, to a knowledge of the many things essential to a wise and comfortable use of heat, also to educate the dealer in coal, and other fuels, in the matter of heating. One man says he would allow coal dealers only to do business who could qualify in a considerable degree in a knowledge of the use of fuel, and that it is as important as qualifying an undertaker to work on us after our dance is over.

Another thought emanating from this third lot of papers is that dealers and installers of all kinds of heating equipment should above all others be well informed in the multitudinous things directly connected with heat. One paper suggests that such a governmental department should be to the entire heat creating and using community what the Agricultural Department is to the studious farmer.

Well, I guess the mental basement, or character element, of most of the men in this class is O. K. Your outstanding thought seems to be to educate and apply.

That kind of character ought to be all right and if it is properly proportioned with honesty, industry, and all those things that human history shows to be common sense, you ought to be pretty good furnace men. No other honorable occupation needs more of those things. No other occupation offers more joy than it does in a knowledge of work well done and that it serves alike, men, women, and children, and that if you help to properly warm a home, you have helped to create a place in which music, literature, art, and the human affections can flourish. In a word, a place in which our christian civilization can grow.

Now, if some experienced brother will dismiss us with his benediction we will close this sermonette.

Doherty Compares Cost of Oil and Anthracite for Furnace Fuel.

A significant statement of the prospect of oil becoming the ultimate fuel, made by Henry L. Doherty, president of the Cities Service Company and the Empire Refineries, before the National Petroleum Association, gains added significance from the fact that Mr. Doherty has long been a prominent figure in the gas-burning field.

Oil, he said, could be used to great advantage for domestic purposes instead of coal. In and around New York City, it costs a minimum of $2.50 a week for house furnace attendance, while $5.00 a week is the usual charge, with a heating season, say 30 weeks. This means a cost of $75.00 to $150.00 a year. If ten tons of coal are used the cost of this attendance over and above the cost of coal amounts to from $7.50 to $15.00 a ton, and this is all saved if oil is used. A minimum of 100 gallons of oil to displace a ton of coal would make this oil worth 7½ to 15 cents a gallon over its fuel value. It should never require more than 185 gallons of oil to displace a ton of coal, and on this maximum amount oil would be worth from 4 to 8 cents over and above its fuel value.

The room required for a coal furnace, ash piles, ash cans, and coal stock is considerable. This space can be greatly reduced by the use of oil and often adds the equivalent of

one or two rooms to the home. This may be worth as much as $10.00 per month for the full year or a total of $120.00 per year.

Anthracite coal sells in and around New York at $15.00 per ton. The competitive fuel value of oil being 15 cents per gallon where 100 gallons will displace a ton of coal and 8.1 cents per gallon where 185 gallons are required to displace a ton of coal. Now let's make up some figures on the basis of a home using 10 tons of coal per year with a cost of $15.00, $110.00 a year for furnace attendance, a saving of $50 a year in space and we will consider the average of 100 to 185 gallons of oil per ton or 142½ gallons of oil.

Coal, 10 tons at $15.....	$150.00
Furnace attendance and removal of ash.....	110.00
Value of space saved.....	50.00
	$310.00

$310.00 divided by 142.5 gallons of oil equals 21.7 cents per gallon as the value of oil to the homeowner.

House Heating Oil Consumption Increasing.

On insistent demand has sprung up throughout the country, said Mr. Doherty, for oil for house heating. This demand was not suggested or even stimulated by the oil companies but some of the oil companies due to the force of this insistent demand are now supplying this demand or are making plans to meet it.

In many cities, said Mr. Doherty, where there is no attempt on the part of the gas company to do house heating, here and there we find a customer heating his entire house with gas. The price of gas is generally $1.00 a thousand or more, and its calorific value is generally 560 B. t. u. per cubic foot or less. So by these figures you will see that many people are willing to pay the equivalent of 25 cents a gallon for oil to heat their homes.

Turton Says He Does Not Mind What People Say About Him and His Dawg.

But He Wants Them to Prove That They Know What They Are Talking About.

THAT problem of Mr. Rose from Missouri—a difficulty of heating the bath room with a pipeless furnace—certainly has brought out a lot of fine suggestions, and no doubt the "Show me" family is quite comfortable by this time while taking their various and respective baths.

However, for fear that Mr. Rose may not have fixed that "robber" pipe properly, our genial friend, George W. Turton, calls his attention to a very important point in that connection, and also cites some very interesting facts bearing on the flexibility of a properly installed pipeless furnace, as well as reminding those whom he is pleased to call "stand-patters" to quit calling his "dawg" names unless they know for sure that the names fit.

Mr. Turton's thoroughly characteristic letter follows:

Pipeless Think Tanks Steamed Up.

Now isn't that gratifying! Steam indicates power and energy to get somewhere. And it looks as though C. B. Rose is going to get enough help to assure him a cozy bath room out of the failure he mentioned on page 19 of your December 1st issue.

Both Mr. Hennesy and Mr. Swager offered good suggestions in your December 15th issue. May I offer just a little further elaboration?

Mr. Hennesy is correct in saying the *"cone must completely cover opening in radiator and fit down tight on radiator."*

And be sure it *does* rest on radiator *all around*—not cocked up on one side, which is easily done when connecting the pipe outside of casing.

Just why is this so important?

Remember, the throat outlet of casing has many times the capacity of the positive pipe outlet, hence the velocity of flow is much greater through the former. If the cone is elevated even slightly above radiator, this greater velocity passing the cone causes a suction through the positive pipe and makes of it a cold air return.

If you will refer to page 16 of July 7th issue of AMERICAN ARTISAN you will find a very clear illustration of a positive installation with instructions.

The typesetter got his fingers tangled and said, "take off a 9 or 10 *foot* pipe according to demands of bath room."

It should have been 9 or 10 *inch* pipe, and use a register with free air capacity equal to the pipe capacity. I have never measured a 9x12 floor register and found a free air capacity equal to that of a 9 inch pipe.

If Mr. Rose will install a positive as per this illustration, putting a small collar around the positive pipe on the outside of both the inner and outer casings, it will give him any temperature he might ask in his bath or any other room not only 9 times in 10 but *every* time.

All this in spite of Lew Langley's 39 years' experience in the heating game which prompts him to say, "It can't be done, Rosie."

The man who coined that phrase was a standpatter. It has been flung at the originator of every worthwhile, new idea. Mr. Langley is today enjoying life by use of several of the "can't-be-done" ideas.

Thirty-nine years is a valuable experience in the heating business and I do not question his ability. But I venture to ask if he has ever installed a positive in a pipeless in the manner suggested, to know from his own experience if it can or can't be done.

I have installed them in 4,217 different homes and *I know they work.*

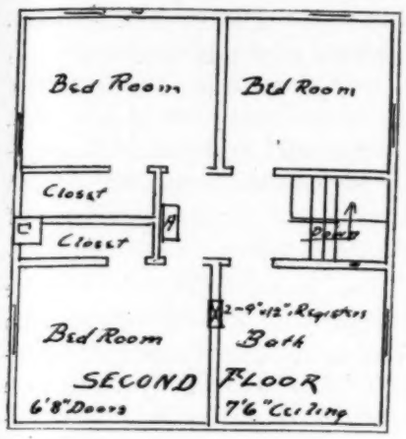
I lived with them in three different houses.

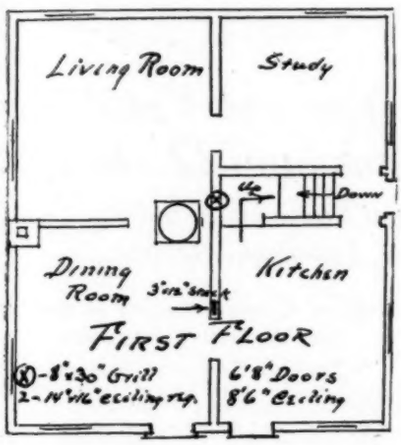
I exacted the utmost from them.

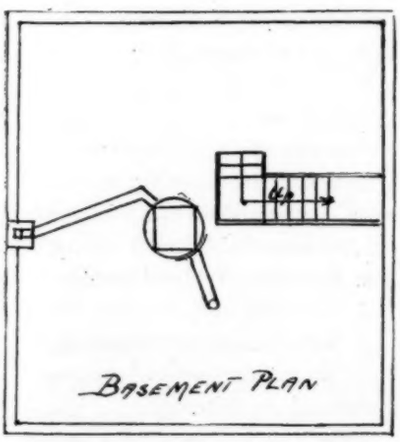
I have seen them fail many times

when wrongly installed, but never when done correctly.

They work in Minnesota, where Mr. Langley lives. I installed one in my own home there. I got a







Plans Showing Robber Pipe and Registers for First and Second Floor as Shown in Issue of July 7, 1923.

furnace man to help me erect a new pipeless. I drew an outline of a positive for him to make. He refused. Said he had been in the heating game 42 years and didn't propose to ruin his reputation by making a "damn fool contraption," he knew in advance would be a failure. He gathered his tools and left, sore as a boil.

I had it made by a fellow who did not link his reputation to my personal desires, and attached to a "Y" connection to kitchen on the main floor and bath on the second floor. Neither room could have been heated without it. Kitchen temperature was same as other rooms. Bath could be made "Turkish" in a few minutes by closing the door, with an inch off of the bottom. This was in the severe winter of 1917 and the "damn fool contraption" spouted comfort in quantity in spite of 42 years' experience that said it couldn't be done.

Mr. Langley says, a warm air pipe at an angle of one inch to the foot elevation will give the best heater on the market a black eye.

I presume he means that is not enough elevation. I believe we all agree the more rapid elevation the better. But here again the pipeless will outdo experience and perform the "can't be done."

To a cone as above described I attached an 8-inch pipe (too small for any practical use) and extended it 30 feet at an elevation of only one-half inch to the foot. On a cold wintry day this pipe delivered a temperature of 188 degrees at its exit in the presence of six men, who admitted they would have said, "it can't be done" if they had not seen and read the thermometer themselves.

I don't cite this as an example to follow. In fact, I'm sure you would fail in the attempt, without the password.

I cite it to show craftsmen of long experience that it *is possible* to make a heating system out of a pipeless. Nothing hard about it. Conquer your prejudice, encourage a little faith, get busy and try. You will find that your old text books, your old suppositions and rules will blush when confronted with analysis and tests.

G. W. TURTON.

Niles, Michigan.

P. S. Just received the issue of December 22nd and note the editor fears the "cat's fur has been rubbed backward." That usually produces a crackling, doesn't it? However, no need to fear any ill results.

Our "Warm Friend" meowed and spat at my "Dawg," and most any cur would whine a remonstrance. Besides, my "Dawg" has few friends, but I know his breeding and record and don't propose to sit quietly in the grand stand and see him shouldered out of the race into antique alley.

"Me and my Dawg, we's been pals for many years; we's worked and played and studied and slept together in every room from the basement to the garret in the third story. We's friends to stick. We never gets mad at what they sez about us. We jes' ask, do they know what they's talking about?"

Some Figures Showing the Distribution of Population in the United States.

There are 2,788 towns and cities in the United States, exclusive of small communities under 2,500 which are considered by the census as rural settlements. Of these, twelve have more than 500,000 population; 56 range from 100,000 to 500,000; 76 from 50,000 to 100,000; 143 from 25,000 to 50,000; 459 from 10,000 to 25,000, and 2,042 from 2,500 to 10,000.

About 15.5 per cent of the people in the United States live in the twelve cities having over 500,000 inhabitants each. Cities with populations ranging from 100,000 to 500,000 collectively account for 10.5 per cent. Approximately 16.4 per cent of the population is in towns of 10,000 to 100,000. About 57.6 per cent, or nearly two-thirds of the total, live in rural districts or small towns under 10,000 population.

Keep your store bright enough at night so it will look as if you were expecting trade. A dully lighted store discourages people from coming in.

Banner-Mahoning Furnace Company Buys Business of Mahoning Foundry Company.

Kyles Corners Property to Be Used in Making Furnaces—Firm an Ohio Incorporation—Capital, $400,000.

THE Banner-Mahoning Furnace Company, Youngstown, Ohio, composed of Akron and New Castle, Ohio, men, has purchased the property and business of the Mahoning Foundry Company at Kyles Corners.

Members of the company say it is intended to transfer manufacture of a line of furnaces made in Akron to Youngstown and greatly increase output there. The company expects ultimately to employ 500 men and make 7,500 furnaces annually. At present about 125 men are employed at the Kyles Corners plant.

The Banner-Mahoning Furnace Company plant at Youngstown will be the main unit in a chain of factories located in Akron, Canton, New Castle and Pittsburgh. All of these are in operation except the proposed Canton unit.

The main offices of the company will be at Youngstown. Workmen and certain officials of the company are now moving to Youngstown from Akron and New Castle.

The company manufactures the Banner furnace at its Akron plant. Hereafter it will be manufactured at Youngstown with the Mahoning furnace which has been produced by the Mahoning Furnace Company. The Akron plant will be devoted to jobbing work, it is stated.

"We are financed and we have nothing to sell the Youngstown public but heating furnaces," said Vice-President Smith in announcing plans of his company. "We will have about a dozen salesmen on the road, covering the entire United States. A sales and display room will be maintained at the plant at Youngstown. Each of the officials of our company has been engaged in the furnace business from 16 to 20 years. It is no experiment with us."

The property at Kyles Corners acquired from the Mahoning Foundry Company consists of thirteen acres of land served by the Youngstown & Suburban Railroad and two practically new and modern factory buildings. One of the structures is 100x240 feet, two stories in height, of steel and concrete construction. The other is 140x200 feet, one story, structural steel.

Vice-President Smith says the plant is one of the best equipped and most modern in the country.

Officials of the Banner-Mahoning Furnace Company are: President, P. T. McGuckian, Akron; Secretary-Treasurer, W. A. Garver, Akron; Vice-President and General Manager, C. Ed. Smith, Jr., New Castle. These and the following comprise the board of directors: Thomas Merriweather, Akron, Manager of the plant there; G. T. Weingardner, New Castle, ex-state senator of Pennsylvania; J. S. Abel, New Castle, President of the Dollar Savings Association, and Adolph Green, New Castle, President of the People's Savings & Trust.

The Banner-Mahoning Furnace Company is an Ohio incorporation with an authorized capital of $400,000, of which slightly more than $300,000 is outstanding. The Akron property is operated by a company known as the Banner Furnace & Foundry Company.

American Society of Heating and Ventilating Engineers Will Meet January 22 to 25.

Program for Annual Meeting at Pennsylvania Hotel, New York City, Has Many Important Features.

THE American Society of Heating and Ventilating Engineers will hold its annual meeting Tuesday to Friday, January 22 to 25, at Hotel Pennsylvania, New York City, and at that time celebrate its thirtieth anniversary.

Secretary C. W. Obert states that one of the most important features of the program will be the presentation for discussion of a proposed Code of Heating and Ventilating Equipment, prepared as a result of years of careful research and investigations by a large committee composed of fifteen sub-committees.

Important papers are also to be presented on various topics of heating and ventilating engineering, one of the most important of which is a discussion of the status of oil fuel for domestic purposes. Research topics will be amply covered by a number of reports at the Research Session on the latest investigations that have been carried out at the Research Laboratory of the Society at Pittsburgh.

Details of the program follow:

Program American Society of Heating and Ventilating Engineers.

Tuesday Forenoon Session.

Announcement of quorum.

Appointment of Tellers of Annual Election.

Address of President.

Report of Council.

Report of Secretary.

Report of Treasurer.

Reports of Committees:

a. Code for Testing Low Pressure Heating Boilers.

b. Guide Publication Committee.

c. Increase of Membership.

d. Legislation.

e. Revision of Constitution.

f. To confer with American Institute of Architects.

Reports of Tellers of Election.

New Business.

Tuesday Afternoon Session.

Ventilation of Department Stores, by A. M. Feldman.

Dust Separation, by A. M. Goodies.

Air Handling in Coated Paper Mill, by Arthur North.

Electric Heating, by L. P. Hynes.

Tuesday evening, Reception and dance.

Wednesday's Session.

10 a. m.—An Improved Method of Determining the Heat Transfer Through Wall, Floor and Roof Sections, by Morris, Germond & Tuttle.

Economical Utilization of Central East Station, by Calvert and Seiter.

Heat Emission from Heating Surfaces of Circular Radiator Furnace, by A. P. Kratz.

The Status of Domestic Oil Heating, by A. N. Ballard.

2 p. m.—Report of Research Committee.

Research and Industrial Progress, by F. Paul Anderson, Director of Research Work.

Measurement of Heat Transmission in Building Structures and a Heat Transmission Meter, by P. Nicholls.

Critical Velocity of Steam and Condensate Mixtures in Horizontal, vertical and inclined Pipes, by Louis Ebin, F. C. Houghton and R. L. Lincoln.

Checking up the Kutter formula and its application to the Flow of Liquids and Gases through small pipes, by L. S. O'Bannon.

8 p. m.—Air Motion, High Temperature and various Humidities Affecting Physiological Reactions of Human Beings, by Dr. W. J. McConnell, C. P. Yagloglou and F. C. Houghton.

Cooling Effect on Human Beings Produced by Variable Air Velocities, by F. C. Houghton and C. P. Yagloglou.

Air Leakage Through the Openings in Buildings, by F. C. Houghton and C. C. Schrader.

The Production and Measurement of Air Dustiness, by Margaret Ingels.

Thursday's Session.

10 a. m.—Report on proposed Code of heating and ventilating Discussion conducted by L. A. Harding, Chairman.

Friday's Sessions.

10 a. m.—Report of Committee to Consider the Report of the New York State Commission on Ventilation, by C. L. Riley, Chairman.

2 p. m.—Unfinished Business.

Installation of Officers.

Allen Has Several Suggestions That May Help Solve Mr. Rose's Pipeless Furnace Problem.

South Dakota Furnace Installer of Many Years' Experience Points Out Ways to Heat Bath Room.

THE new year starts out right! The first letter we opened on January second was one in which a South Dakota installer shows how a Missouri installer may adjust his pipeless furnace job so that it will heat the bath room. Here it is:

To AMERICAN ARTISAN:

I will follow Mr. Turton's suggestion and come on, as follows:

In "Subscriber's" plan on page 10 of your December 22nd issue, he shows a pipeless register, also three other cold air registers.

The first thing I would do in this case: Remove the inner cone tops and these only, making the register serve for warm air only.

I would take cold air from the kitchen. These four cold air registers must equal the area of the furnace.

Now let us forget this and start another.

I have successfully heated rooms with warm air four ways.

1st. With a stove or fireplace.

2nd. With a pipe running to a register in the floor, baseboard or above the baseboard in the wall.

3rd. I have run a square pipe from the basement to the attic and dropped into the different rooms through the ceiling (Handlan Overhead System).

4th. I have placed a grill close to the ceiling, generally above the doors, down-stairs and up-stairs (if an open stairway), sawing off the bottom of the up-stairs doors to give ¾ inch clearance. By leaving the doors open down-stairs, I have gotten satisfactory results from a pipeless furnace.

I think if Mr. Rose would take the furnace end of his "Robber" pipe and cut it off so that it would just reach through the outer casing of pipeless furnace closing up the other holes, so that this "Robber" pipe would steal the cold air from the bath room, then place an oversize grill close to the ceiling in the wall nearest the register, he would have no trouble heating the bath room and still maintain the dignity of the pipeless furnace.

Perhaps I am wrong.

Come on, fellows.

Yours truly,
A. A. ALLEN,

1209 S. Main, Aberdeen, South Dakota.

Haynes-Langenberg Announces Change in Pipe and Fitting Prices.

Haynes-Langenberg Manufacturing Company, St. Louis, Missouri, has issued the new discount sheet No. 19 of Front Rank Double and Single Pipe and Fittings. The new discounts on Sheradized Steel Safety Chain, Iron Jack Chain, Stove Pipe Wire and Pokers will be found on the market price pages of this issue.

Warm Air Furnace Special Is a Winner.

To AMERICAN ARTISAN:

Your Warm Air Furnace Special which we have just received is a winner.

Yours truly,
Hamilton-Graham Company.
CHARLES H. GRAHAM.
Oskaloosa, Iowa, January 5, 1924.

There is a moral as well as healing influence in things which amuse and make us enjoy life. No one was ever spoiled by good humor, but tens of thousands have been made better by it. Fun is a food as necessary to the wholeness of man as bread.

Constructing a Sheet Metal Spiral Pipe Chute to Be Used as an Outside Fire Escape.

Kothe Develops Pattern for Sheet Metal Fire Escape Structure at the Request of AMERICAN ARTISAN Subscriber.

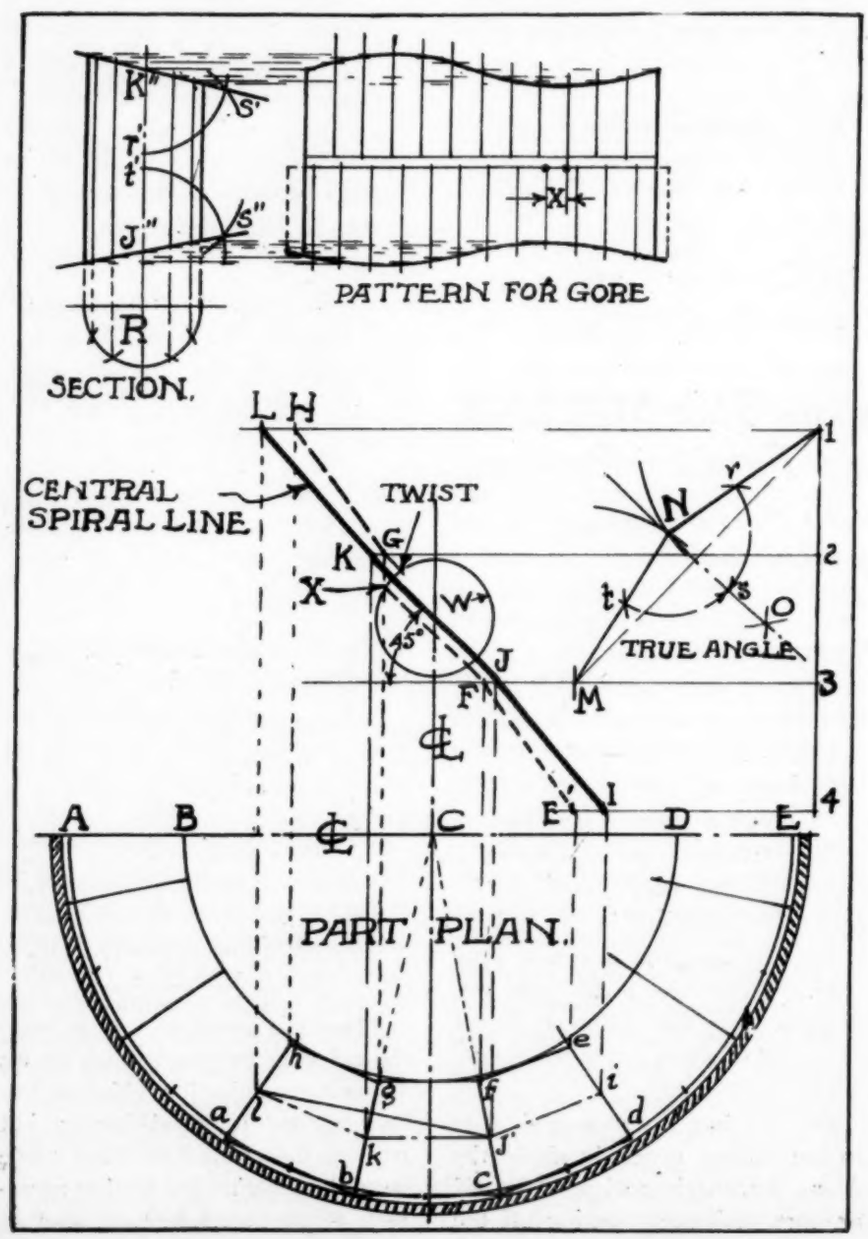
Written Especially for AMERICAN ARTISAN by O. W. Kothe, Principal, St. Louis Technical Institute, St. Louis, Missouri.

REPLYING to the inquiry of a subscriber who wishes patterns for a spiral pipe such as are used in fire escapes, we submit the accompanying drawing as a method of making the patterns.

The half plan is first drawn to its proper diameter by drawing the inside line of shell and then describing the heel of elbow pipes. The center vertical and horizontal lines will leave the effect of two 90-degree elbows, or the semi-circle is divided in as many equal parts to make the desired number of gore pieces. In this case we have 16 gores to make a revolution, and as the sketch submitted shows one and a quarter turns, or thus requiring some 20 gore pieces. The height that this makes can be determined by measuring one of the spaces as 2-3 as the central rise of one gore; then multiply this by 20 and we have the total height.

In this case the semi-circle A-E is divided into 16 equal spaces, which makes the miter lines come correctly. If more gores are desired, allow two spaces for each gore piece and only one space for each end gore the same as for an elbow, and the divisions will come out correctly. In this case we only need the four miter lines shown by a-b-c-d which are drawn to center C. We must finish the outlines of these gores and also put in the central axis lines as i-j-k-l. Then anywhere above we use the 45-degree triangle and pass a diagonal line through the vertical center line as K-J. Then from points j-k in the plan we erect vertical lines to cut off this 45-degree line as shown in points K-J. This line then becomes a true length and represents the central axis line for one gore.

By bringing horizontal lines through these points K-J to a vertical line at the side, we have the vertical height as 2-3 of one gore. By picking space 2-3 and setting it as 2-1 and 3-4, and again bringing horizontal lines into elevation and then erecting vertical lines from each point as l-h-i-e, we thereby establish the points L-H and I-E′ in elevation. Points G and F are established by bringing up lines from g and f of plan. This enables drawing the central spiral line as L-K and J-I, also the dotted line to represent the throat line as H-G-F-E′. These lines are part of what would make an elevation spiral line of chute if enough spaces as 2-3 were added and the projection continued, but for development work they are not necessary.



Showing Pattern for Sheet Metal Spiral Fire Escape.

Next describe the section W to suit the diameter of pipe from the center, and by bringing the dotted throat line F parallel with J-K to X and bringing the point G parallel with J-K to intersect the circle, we thereby have the amount of twist or turn that one pipe will turn over the other. These arrow points show how the throat lines F and G will break out of line in making the turn, and hence we use this turn X as our twist in pattern.

Now to get a true angle of this pipe we must take two gore pieces from plan and build up a diagram as in true angle. So, pick the plan line j-l and set it in diagram as 3-M. As we nave the spread of two gores in plan, so we must also use two altitudinal spaces of elevation, or the distance 3-1 in diagram. A true diagonal line would then be as line 1-M; but since our pipe makes a bend, we must develop the angle. To do this, pick the true line J-K of elevation as radius, and using points 1 and M as centers, strike and cross arcs in point N. Draw this angle M-N-1. Then bisect this angle as at O and draw the miter line O-N, and we are ready to construct our elevation for developing the pattern.

Draw any vertical line as R-K″, making K″-J″ equal in length to J-K of elevation. With dividers transfer the angle r-s from diagram by first describing arc r-s-t from N, and then with the same radius, using K″ and J″ as centers, strike arcs r′-s′ and t′-s″. Next pick the spread as r-s from diagram and set as r′-s′ and t′-s″ in our working drawing. Then draw the miter lines s′-K″ and s″-J″, and by means of section R finish the elevation the same as any elbow pattern.

Now the upper half of pattern is laid off the same as any elbow and does not need further comment. Since the throat makes a turn equal to the distance X, we therefore set this over from the throat line as the two heavy dots show. From here on the girth is again stepped off the same as above, only using the new point made by X so as to work in the twist. After this develop the pattern as usual, and the spaces shown dotted are merely to help establish points for finishing the miter line, and these will fall off.

This, then, is the pattern, and it must be rolled up so your twist comes right; also be sure to use the twist on the upward and so it will not point in an opposite direction. Before making such things out of large work, it is best to make a sample where you can do all the experimenting. Laps for riveting must be allowed extra on all edges and seams and rivet heads should, no doubt, be counter sunk so a perfectly smooth surface is left on the inside. There is quite a bit of engineering about a thing like this, and so do not be discouraged if you encounter difficulties with your first trial.

What the Sheet Metal Contractors Should Know About Zinc as a Roofing Material.

Kendrick A. Hatt Asks Several Pertinent Questions as to Durability, Method of Laying, Cost as Compared with Other Roofing Materials, Etc.

IN A very well written article, Kendrick A. Hatt, Associate Editor of *The American Contractor*, points out some very salient truths to the manufacturers of zinc roofing and emphasizes the necessity for bringing definite data and concise information on certain specific questions to the attention of the sheet metal contractor as well as to the general contractor.

Mr. Hatt talks in a language that is easy to understand, and he sets forth in a plain, straightforward manner some of the essential factors on which the contractor must have positive knowledge before he will give much attention to zinc as a roofing material.

The columns of AMERICAN ARTISAN are open for a full and free discussion of the questions brought up by Mr. Hatt, as well as for any other questions touching upon the use of zinc as a roofing material.

Manufacturers, distributors and erectors of zinc, as well as sheet metal contractors in general, are invited to take part in this discussion.

Mr. Hatt's article follows:

What the Contractor Should Know About Zinc.

What does the average contractor know about the many uses of that permanent metal, zinc?

When I was asked to prepare a short article upon the subject, it was a surprise to me to finally realize the many possibilities of zinc. In its several forms they for long have been overlooked by the contractor. I had always supposed that zinc was generally known to have a few select uses in the construction and building industry, but that it was fast succeeded by other metals, not because of the lack of a good sales policy, but more because better and cheaper materials had been put on the market, and backed up by effective publicity.

It is easy to understand, then, my surprise when a cursory investigation demonstrated that such was not the case. I found uses for zinc which neither I nor, I suspect, thousands of other contractors had given scant attention to heretofore. Of course, the wide use of zinc in other industries was unquestioned, but the use of sheet zinc or zinc units in construction I found to be great in possibility, although comparatively slight in actuality.

Perhaps in my first thoughts in connection with zinc I overlooked many of the smaller and varied uses that zinc sheets might be put to inside of the structure and concentrated largely upon it as an outside or roofing metal, since metal roofs are coming more into general use every day. The results of my investigation were most interesting from the contractor's point of view, and I am sure this viewpoint will be held by thousands of others if the value and merit of zinc is presented to us in the proper way.

Take, for instance, this very subject of roofs found on various types of structures. If you ask the average contractor what sort of roofs he has put on during the past five or ten years, he will probably answer somewhat as follows:

"Within the fire limits I usually put on tile, gravel, composition shingles, roll roofing, galvanized sheets or copper, while on an outside job I often go back to the good old-fashioned wood shingle."

From this you will see there is usually no mention made of zinc roofs either in sheets, shingles or corrugated. If you ask the same fellow about such things as cornices, troughs, downspouts, leaders, flashings, or other such items, he will tell you the metals include tin, galvanized iron or copper. Coal tipples or bunkers, founderies, metal-working plants and many types of manufacturing structures are frequently made of sheet metal. The common practice on walls and roofs of such buildings is to use corrugated galvanized sheets. I use the term "common practice" because heretofore contractors knew little or nothing about the value, merit and permanency of corrugated zinc sheets.

This is your fault, not ours.

And when you come to think of it, how in the name of Tophet is the contractor expected to give any other sort of answer, knowing next to nothing about zinc?

The contractor hears all about the merits of brick, concrete, tile, terra cotta, stone, galvanized iron, metal lath, composition shingles and copper. He reads about them in practically every magazine he picks up. He is receiving informative literature on their value and merit in his mail nearly every week. He knows that these products have the approbation of the architects because he frequently reads the advertisements of these products in architectural journals and trade papers, and knowing that they have the good will of the great mass of architects, he is keen to take advantage of it, and therefore satisfy a requirement.

The copper fellows are wide awake to these possibilities and have been since the end of the war threatening to close down the great mills that were constructed for the purpose of making cartridges and wire. Copper used to be a most "exclusive article of furniture" as far as the builder was concerned, but nowadays practically every builder knows that it is a good metal to use on his job—if the client will stand a little higher cost. In his search for the dope on more economical sheet metal, the contractor has lost sight of zinc and he therefore knows very little about it—and it's up to you to tell him.

WILL YOU DO THIS?

YOUR Christmas advertising campaign for 1923 was doubtless the best in the history of your business.

You saw trade going to other stores which could have been yours for the asking, and determined to get your share of it, and you did, by advertising.

The new year is now well under way—inventories have been taken care of, etc., you have a clear idea of which of your advertisements were the most productive.

These advertisements will form the basis for some excellent advertising stories for the 1924 Christmas advertising campaign.

Won't you please collect a few of those most readily available and mail them to us?

Will you do this now?

This brings us up to date.

Remembering that the contractor is quite ignorant of zinc as a permanent roofing material and that he knows that architects and owners have been "sold" on many other forms of roofing, it seems pertinent that I should now get back to my original topic—what the contractor should know about zinc.

First of all, he wants to know what he can *save* by substituting zinc for other metals, where some particular metal is not specified. This means not only the first cost of the sheets, shingles or corrguated, but how much he can cut down on the size of the structural members and still have a good job. Is zinc lighter than other metals? Is it lighter than any other type of roofing? How much lighter? But, by all means remember, talk it in *dollars and cents* to the contractor. It is the language he understands the best, and if the arguments can be reduced to terms of money you can be assured of his undivided interest.

If there are simple specifications that he can get, where are they? Who has them? Are they on file in reference libraries or with local architects? If the contractor is expected to use more zinc than he is using at present this part of the job must be carefully and quickly done and explained to him in words of one syllable, with sufficient drawings to get the points over to him quickly.

Tell him how much he can save on labor by using zinc instead of tile or any other material. Tell him who can put up the stuff and not be in bad with the labor unions. Does a zinc shingle roof call for a high-priced sheet metal worker, or will just a carpenter or an ordinary "hunky" do the job? How many squares can a man put on in one eight-hour day? Can he make a water-tight job of it at high speed?

All this talks *dollars and cents* again—the contractor's favorite language.

The contractor should be supplied with instruction sheets, or a booklet of some sort, profusely illustrated, so that his erection crew can work properly and do a permanent, lasting job. No doubt there are many time- and labor-saving short cuts in erecting roofs and sidings that will mean money to the contractor and he wants to know them.

He wants to know how long zinc will stay on the job. Will it last two years, ten years, fifty years or a hundred years? Will he be protected on his contract or will he have to make good for a leaky roof or wall before the grass grows again in the yard? If the architect just specifies sheet metal without naming any particular kind, can the contractor get safely by with zinc, or must he stick to copper or galvanized iron or steel?

Old man *Dollar* again.

Mr. Contractor will want to know about the quality of the product. How does the product of one mill

differ from another? Will all zinc products be chemically the same, or must he use care in inspecting every piece that comes on the job? What impurities are to be expected, if any, and how will they affect the wearing qualities of the metal?

Will there be a laboratory organization back of the product to keep him informed as to the quality of the zinc, or will he have to take everything "on faith"?

It will all mean *money*, again.

Getting back to the instruction book, the contractor will want to know of any new or unusual methods that must be used in erection. Whether zinc has to be kept away from direct contact with other metals and what protection is needed? Does zinc have to be painted to keep it from oxidizing, or will it hold up on its own account? Does it stain other materials after a hard rain, or does it change color in any way?

All of these questions may mean still more money to the contractor.

I know a good deal about copper. I have been told for a year or so in advertising and in booklets a great many things that are practical and sound. I didn't know that all these applied equally to zinc, and at considerably less cost. Bear in mind there was no real reason why I *should* know much about zinc. Nobody ever told me. And I don't think it is up to the thousands of contractors spread over this country to have to dig up their own information. That's up to you zinc people.

In conclusion let me say that the contractor is up against a very stiff proposition. In the first place his bid must be the lowest if he gets the job, and then he must not only put up the job within his figure, but must do it so well that there will be no comeback after the owner takes possession. You all know that the contract is awarded to the "lowest responsible bidder," and that phrase "covers a multitude of shins," as the stocking makers says.

Show the contractor that he can do as good or a better job with less money by using zinc and he will be your friend for life.

This Is a True Story About the Making of a Still, but Not of the Kind You Think.

How Oxy-Acetylene Welding Process Makes It Possible to Use Certain Metals in Manufacture of Chemicals and for Other Purposes.

A 1,900-gallon still would be a pretty difficult proposition to hide from Mr. Volstead's sleuths, but the Bournonville Welding Company, New York City, was not afraid of that—they just went ahead and made it, for the order stated that it was to be used as a rosin still.

Aluminum vessels possess some exceptional qualities for a number of industrial purposes, and especially is this so for the manufacture of chemicals and foods. That aluminum has not long since been used more extensively for such devices as retorts, stills, agitators and digestors is largely due to the difficulty encountered in fabricating heavy plates and sheets of this metal. The characteristics of aluminum which make riveting impracticable in many cases, and likewise cause rejection of many other joining methods, are surmounted by oxy-acetylene welding. Several large stills recently built of ¾-inch thick aluminum plate demonstrate the practicability of fabricating heavy sections of this metal by the oxy-acetylene process.

When a job welding company accepted a contract to build several 1,900-gallon capacity rosin stills of ¾-inch cold rolled aluminum it was apparent to them that considerable experimenting would be necessary to develop the best methods and practices for doing the work. There were no recorded precedents to follow, but their long experience in oxy-acetylene welding a variety of cast and rolled aluminum products helped them considerably in determining the methods to be employed. Practices which were followed on lighter aluminum work have thus been applied with excellent results to the fabrication of these stills.

There is a great similarity in the methods used to weld aluminum plate and steel plate. The familiar practices recommended for the latter serve to good advantage on aluminum plate ½-inch thick and heavier, with but few exceptions. Adequate and careful pre-heating is very essential on all aluminum work, but the ordinary method of playing the blowpipe flame on the parts adjacent to the weld section before beginning a weld, which is good practice on aluminum sheet, is not sufficient when handling aluminum plate.

The stills were built according to the users' specifications and contain twelve separate pieces of ¾-inch plate; a dished top and bottom to each of which were welded four segments that form the sides and two semi-circular pieces forming the waist or center sections. The pieces were cut to a predetermined size at the mill. These were received flat, formed to shape and prepared for welding by beveling the edges to 45 degrees in the welding shop. A hydraulic press specially constructed for the purpose and large wooden mallets were used to form the sections to shape. Extra care was exercised in forming the sections to avoid delay and trouble in fitting and matching the parts during the welding. Preparations for welding were also carefully planned, because once the welding of an aluminum joint is begun it must be finished with the fewest interruptions possible. Openings for fittings and connections, which were cut after the sections had been formed, were also beveled to 45 degrees and chipped to a smooth, clean surface with an air chisel.

Two 2-inch air and gas torches were used for pre-heating. The metal was pre-heated to nearly the melting point in semi-circular sections 6 inches on each side of the

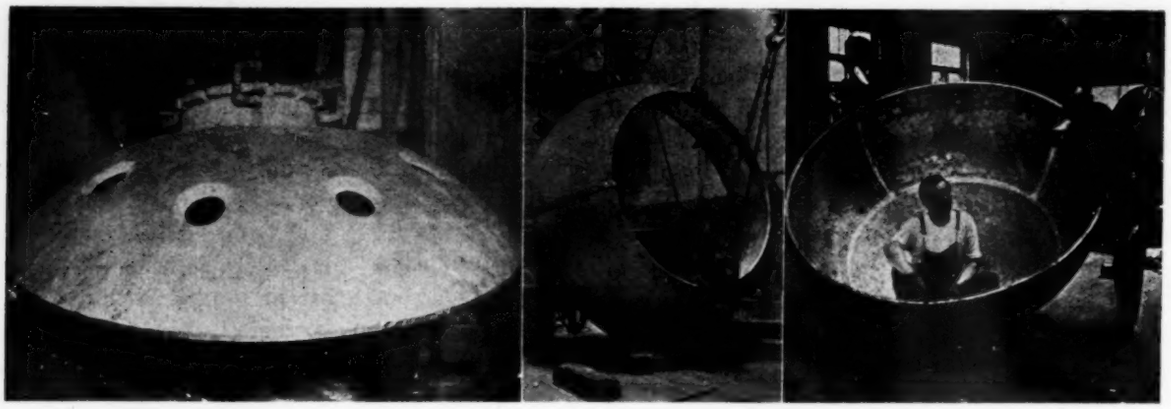
line of weld and just ahead of the operator, as the welding advanced. This permitted the fusion of the edges and the addition of the welding rod at a rapid rate, and consequently speedy execution of the work. But the principal reason for pre-heating was to compensate for the forces of expansion and contraction. Local pre-heating proved sufficient. Had more extensive pre-heating been necessary, this could have been done without trouble, although more time, of course, would have been required. The operators who welded the stills had been thoroughly trained in handling aluminum and as a result it was not necessary to go over any of the work, a process which should be avoided on heavy aluminum.

Seams were only slightly reinforced by building up and, as the photographs indicate, were not finished off. A drawn aluminum rod of assured quality and of about the same analysis as the plate was used for a filler. That careful preparation, pre-heating and welding is worth while is witnessed by the fact that the first still constructed required the removal of less than 5/16 inch of metal to fit the last segment in position. Tests on subsequently built stills proved these were in comparatively perfect alignment and according to specifications.

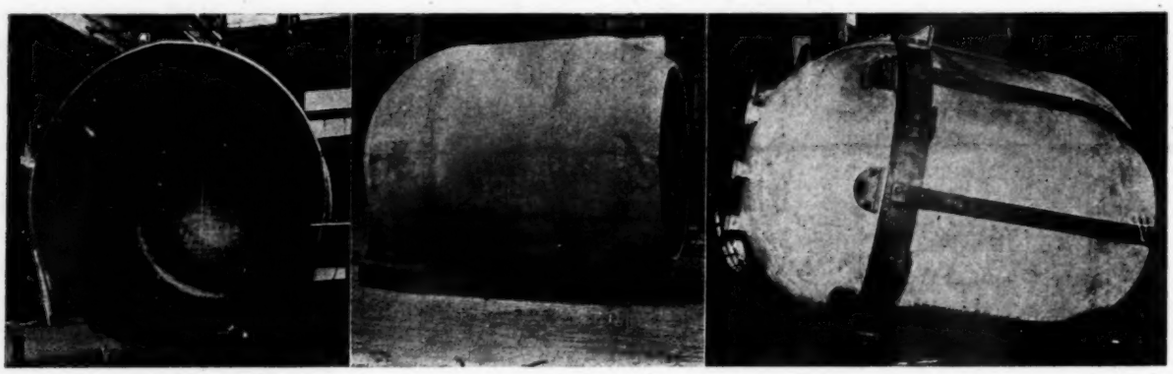
The fittings and connections consist of one 10-inch blow-off hole and six 4-inch flange pipe connections. These are all cast aluminum and are oxy-acetylene welded to the cold rolled aluminum top section. The joining of these two differently processed metals is a particularly noteworthy part of the welded fabrication.

Stills of this type have now been in use for some time and have thoroughly demonstrated their superiority over similar devices constructed of other metals. The manufacturer using them had tried to use steel, copper and lead-lined vessels, but none of these gave service which could approach that given by the welded aluminum stills. These are subjected to a contained temperature of 600 degrees Fahrenheit under a partial vacuum. Heat is also applied externally and the stresses induced by the high temperature are augmented by others resulting from sudden temperature changes, these providing a severe test of the welded construction.

Although these particular stills have been used only for rosin distillation, it would seem that similar vessels would prove especially adaptable to the requirements of all chemical, candy and other manufacturers who require a vessel of high tensile strength and heat conductivity, that is not subject to chemical reaction, which can be easily cleaned and which is economical to manufacture. Aside from the advantages of aluminum over other metals in these fields, the all oxy-acetylene welded construction which provides



Completed Bottom. Edges Chamfered for Welding. Welding a Seam.



Interior View. Side View. The Completed Still.

Upon completion of the first still a test was made, subjecting the vessel to 150-pound cold water pressure, and no leaks showed. This in itself was quite remarkable when consideration is given to the amount of welding, 308 linear feet.

The stills were fabricated progressively, from the bottom section up.

a seamless and consequently leak-proof vessel is almost sufficient recommendation in itself for the use of an all-welded aluminum vessel in preference to other types.

Office and Sales Room of E. H. Ward & Company, Lansing, Michigan, Destroyed by Fire.

E. H. Ward & Company, sheet metal contractors and furnace installers at Lansing, Michigan, suffered the misfortune a week ago of having their office and show room destroyed by fire.

P. A. Johnson, Secretary of the Company, informs us, however, that most of their permanent records were saved, though some of them got a good soaking.

They are now located on the third floor of the Capitol National Bank Building, not very far from their former office. Their work shop was not affected by the fire.

Just in passing, it is worthy of mention that E. H. Ward & Company sold over 300 furnaces in 1923, and "E. H." says that their advertising had a lot to do with bringing up the total.

Committee to Enforce Landis Award Predicts Continuation of Building Boom.

Every indication now visible points to a continuation of the tremendous building boom started in 1923, with the resulting abundance of work for all those contractors operating under the Landis Award.

During the year 1923 all previous building records in the Chicago district were shattered. Building permits granted during the year approximated $340,000,000 for Chicago and suburbs, compared with $227,000,000 for 1922.

Some idea of what the Committee to Enforce the Landis Award means to the mechanic may be had from the fact that in 1923 it placed in various branches of the building industry more than 28,000 workmen, bringing the total for two years up to 57,000. The great boom has been free of all the disturbing influences which did so much to militate against progress in the past. The grafting labor leader has been shelved and all intimidating of workmen has been wiped out through the operations of the committee and its supporters.

Insurance against "sabotage" carried on Landis Award structures in 1923 reached the enormous total of $155,000,000, compared with $114,000,000 in 1922.

The committee's building trades apprentice school at 500 South Throop Street had an enrollment in 1923 of almost 800 boys and young men, and it is growing apace. The success of this school has attracted attention of the nation, and similar institutions have been established in a number of the more important industrial centers.

Reinsdorf & Werve Is New Sheet Metal Contracting Firm in Kenosha, Wisconsin.

H. Reinsdorf and A. Werve called at AMERICAN ARTISAN offices on January seventh to enter their order for subscription, as they are going into the sheet metal contracting business in Kenosha, Wisconsin, under the firm name of Reinsdorf & Werve Sheet Metal Works, 124 to 132 Third Street.

Mr. Reinsdorf was formerly with the Kenosha Hardware Company. The new firm will do a general sheet metal business, including skylight, roofing and ventilating work and furnace installation.

They desire to have manufacturers in these lines send them catalogs and price lists.

1923 Zinc Output Much Greater Than That of Previous Year.

The output of primary metallic zinc from domestic ores in 1923 was about 485,000 tons and from foreign ores about 2,000 tons, a total of 487,000 tons, as compared with 353,274 tons from domestic ores and 1,003 tons from foreign ores, a total of 354,277 tons in 1922.

In addition to primary zinc there was an output of about 40,000 tons of redistilled secondary zinc, as compared with 32,988 tons in 1922, making a total supply of distilled zinc and electrolytic zinc in 1923 of about 527,000 tons, of which 145,000 was high grade and intermediate, 75,000 tons select and brass special, and 307,000 tons prime western zinc. The output of the corresponding grades in 1922 was 103,861, 49,980 and 233,424 tons, respectively, a total of 387,265 tons.

Of the total output of primary zinc in 1923, about 21,000 tons was made in Arkansas, as against 13,627 tons in 1922; 80,000 tons in Illinois, as against 76,266 tons in 1922; 118,000 tons in Oklahoma, as against 74,537 tons in 1922; and 84,000 tons in Pennsylvania, as against 57,319 tons in 1922.

E. R. Grim, Veteran Sheet Metal and Hardware Man, Passes Away at Age of 83 Years.

Many of the old time sheet metal and hardware men in Ohio will learn with regret that E. R. Grim, formerly located at Morrow, Ohio, passed away recently in Lebanon, Ohio, at the age of 83 years.

Mr. Grim learned the business in his father's shop and store which was established in 1849. He served three years and six months in the Union Army, but although he was in twenty-six pitched battles he was never wounded.

Upon receiving his discharge he bought out his father and operated the business in the same place for fifty-three years, until 1918, when he sold out and moved to Lebanon. He was one of the early subscribers of AMERICAN ARTISAN and continued so until his retirement.

In the latter part of November, 1923, Mr. Grim suffered a paralytic stroke which left him unconscious for five weeks, death coming on the last day of the year.

He was a member of the Masonic fraternity over fifty years.

Mr. Grim leaves a son, R. A. Grim, who is associated with the Schwabacker Hardware Company,

Seattle, Washington, and a daughter, Miss Augusta E. Grim, San Diego, California.

E. L. Dougherty Opens Sheet Metal Shop in Ottawa, Illinois.

E. L. Dougherty is going into the sheet metal contracting business in Ottawa, Illinois. He was in Chicago during the first week of the year buying supplies and machinery for his shop, which is located in the rear of Engle's Cloak and Suit Store on Jefferson Street.

The following announcement has been sent out by Mr. Dougherty:

DEAR FRIENDS:

Having severed relations with the A. Hardten Company Tin Shop, I desire to announce that on and after January 15, 1924, I will operate a first-class, up-to-date sheet metal shop in the building to the rear of Engle's Cloak and Suit Store, just off Jefferson Street.

I take this privilege of soliciting your business, doing first-class, up-to-date work at reasonable prices. Would be pleased to call on you and give you an estimate on your next work. No job is too large or too small.

Wishing you a Happy and Prosperous New Year, I am,

Yours truly,

E. L. DOUGHERTY.

Phones: Res. 646-K, Shop ——.

This Loose Leaf Catalogue of Sheet Metal Taxes Should Be in Your Business Library.

A rather unusual idea has been embodied in compiling a new catalogue by the Whitney Metal Tool Company, 93 Forbes Street, Rockford, Illinois. This is of the loose-leaf type with the pages held in place between two stiff cardboard covers by three rings. This affords an opportunity to insert new leaves as they may be received.

The catalogue as issued contains complete descriptions of all the products made by the Company, not only of all its hand punches, but on all its other products. For example, it shows the Company's bending fixture, its straightening machine, its angle iron shear, its bench shears and other products which are probably not as well known as its ball-bearing hand punches.

This is a catalogue which will undoubtedly prove of value to a great many sheet metal men and a copy will be sent anyone for the asking.

Government's Principal Duty Is to Insure and Maintain Fair Play.

I conceive it to be the prime obligation of government that it shall maintain Fair Play, so that every individual shall have his own chance to make his own place in the social structure, by his own character and ability, and his own willingness to effort; that in the very interest of the preservation of fair play, government must assume some relation of regulation at times, in industry and in private life. But if we can preserve the main incentive, that government shall, in whatever it does, touch industry and the private lives of the people in such a way as only to preserve fair play and stimulate the desire to acquire and accomplish, then we shall continue this splendid aggregate of National attainment.

Hamilton - Graham Company and Hamilton-Hamilton Hardware Company, Oskaloosa, Iowa, Consolidate.

Two Well Known Sheet Metal, Furnace and Hardware Organizations Now Under One Management and in Larger Quarters.

TWO important companies in Oskaloosa, Iowa, were consolidated on January first, bringing under one corporate management the Hamilton & Hamilton Hardware Company and the Hamilton-Graham Company, the latter being engaged in furnace installation, general sheet metal contracting and manufacture of fire doors and ventilators.

The name of the new corporation is the Hamilton Hardware Company, the stockholders being A. A. Hamilton ("Gus"), who is in charge of the Hamilton Hardware Store in Des Moines; J. F. Hamilton ("Frank"), and Charles H. Graham under whose supervision the sheet metal and furnace business has grown to very large proportions.

The making of the fire doors and ventilators is more than a state-wide business and is growing rapidly. The Oskaloosa factory is one of two places in Iowa engaged in the manufacture of fire doors and specially licensed to do this work.

During the rush season when the setting or furnaces requires special attention, the company carries twenty-five to thirty men on its payroll, and its business reaches to the far corners of Iowa and into adjoining states. It has come to be one of the large institutions of Oskaloosa.

At the hardware store, 117 High Avenue West, the basement is as much of a show room as the first floor and is filled with merchandise carried in stock. The floor of this department was lowered two feet and concreted, and a steel ceiling was put up.

The factory business of the former Hamilton-Graham Company had grown to such an extent and the wholesale supply business of the establishment has been increasing at a rapid rate that demanded additional space, and yet the new establishment needs every square inch it can find.

The factory and metal working department, which has been under the personal management of Charles H. Graham, has just completed occupancy of its new quarters in the north section of the Vermillion Building along the north side of the

alley at the rear of the new Hamilton hardware store, moving from the former workshop quarters in the Phelps Building that fronts on A Avenue.

The new company occupies a total floor space of 10,500 square feet.

Sheet Metal Contractors' Association of Chicago Re-elects All Officers.

At the recent annual meeting of the Sheet Metal Contractors' Association of Chicago—generally known as "Number One"—the following were re-elected to serve in their respective offices:

President—Harry C. Knisely.

Vice-President—Harry J. Dettmers.

Treasurer—Thomas P. Shean.

Secretary—David M. Haines.

Glenn A. Wilson Appointed New York Manager for Gibb Instrument, Michigan.

The Gibb Instrument Company, Bay City, Michigan, manufacturers of electric welding equipment, announce the appointment of Glenn A. Wilson as manager for New York and New England territory, with headquarters at 120 Liberty Street, New York.

Mr. Wilson formerly represented the Mutual Electric and Machine Company.

Sheet Metal Contractors' Work Increasing Each Year.

With the recognition of the value of scientific window displays has come the advent of the display window especially constructed to allow the greatest vision possible. The old immense iron and wooden posts which formerly obstructed an uninterrupted view of the display from the street have given way to the copper and bronze framework holding in place the immense single sheet of plate glass.

Then again, attractively designed sheet metal ceilings and side walls have been substituted for the old dark wooden backgrounds which absorbed every ray of light that struck their surfaces.

Lighting systems have been made to direct their rays on the objects displayed, throwing a glamor about them never thought in days of yore.

Each step in the advancement of these arts brings about increased labor and profit for the sheet metal contractor, because of the pliable qualities of the metal with which he works.

The high standard of workmanship possible at relatively small expense is increasing the uses of sheet metal daily. As the amount of work increases, the cost of each unit decreases in a direct ratio, because of the greater production made possible by highly specialized labor.

AMERICAN ARTISAN Will Follow Mr. Kistler Into the Sunny South.

To American Artisan:

Kindly discontinue my advertisement, as I have procured a good position through your assistance, having accepted an offer from Alabama.

Please be sure to change my address from Brookfield, Missouri, to Sylacauga, Alabama, as I wish to get the old standby in my new home.

Milton L. Kistler.

Notes and Queries

Copper Rivets.

From J. C. Moebus, 1752 Oregon Avenue, Butte, Montana.

Will you please inform me where I can get 1½, 2 and 3-pound all copper rivets, equal in size to 1½ and 2-pound tinners' rivets?

Ans.—Merchant and Evans Company, 347 North Sheldon Street, and C. G. Hussey and Company, 224 North Jefferson Street; both of Chicago, Illinois.

Humidifier for Warm Air Furnaces.

From Charles E. Arnold, 817 University Place, Evanston, Illinois.

Kindly tell me who makes humidifiers for warm air furnaces.

Ans.—Haynes-Langenberg Manufacturing Company, 4057 Forest Park Boulevard, St. Louis, Missouri; Geo. W. Diener Manufacturing Company, 400 Monticello Avenue, Chicago, Illinois, and W. J. Haynes, 328 West Sixth Street, Kansas City, Missouri.

Milk Can Faucets.

From Ralph W. Poe, 150 North Main Street, Canton, Illinois.

Where can I buy N. P. or tinned brass milk can faucets, ⅝-inch or larger?

Ans.—Hibbard, Spencer, Bartlett and Company, 303 North State Street, Chicago, Illinois.

Cast Iron Smoke Pipe.

From Mr. Prautwien, 12 West 55th Street, Chicago, Illinois.

Where can I get cast iron smoke pipe?

Ans.—It is manufactured by Waterloo Register Company, Waterloo, Iowa, and you can secure it from Manny Heating Supply Company, 131 West Lake Street, Chicago, Illinois.

Ventilating Fan in Vertical Position.

From S. F. Wandschmider, c/o Fort Shelby Hotel, Detroit, Michigan.

Who makes a ventilating fan in a vertical position?

Ans.—American Blower Company, Detroit, Michigan.

Book.

From Magnus C. Christensen, Hemingford, Nebraska.

What steel company can furnish me with a hand book showing where the angles are displayed in design and sizes and the neutral axis measurements given?

Ans.—Joseph T. Ryerson and Son, 2558 West 16th Street, Chicago, Illinois.

Repairs for "Queen" Lawn Mower.

From A. E. Browder, 2717 East Broadway, Long Beach, California.

Where can I secure repairs for the "Queen" lawn mower?

Ans.—This is manufactured by Dille and McGuire Company, Richmond, Indiana, and they, no doubt, can furnish repairs.

Address of L. J. Mueller Furnace Company.

From L. A. Campbell, 10008 East Madison Street, Danville, Illinois.

Will you please send me the address of the Mueller Furnace Company?

Ans.—The L. J. Mueller Furnace Company is located at 193 Reed Street, Milwaukee, Wisconsin.

Robert Walden Increases Sporting Goods Sales With Unusual Type of "Newsy" Advertising.

Makes Store Headquarters for Information on Hunting Laws, While He Himself Uses Goods He Recommends to Others.

SOME sage advertiser has said that introducing current news into advertising copy is an excellent practice, if, in fact, it is not an absolute necessity. In many cases this mode of telling the story is so cleverly carried out as to completely clothe and submerge from the reader the actual purpose.

There came to our attention recently an advertisement of this nature, which appeared in the *St. Petersburg, Florida, Times.* The advertisement was one column wide and extended the length of the sheet. Incidently, the sheet contained fourteen pages in all, six of which were given over entirely to real estate advertising, while that of hardware and stoves, as usual, was lacking, with the exception of the hardware ad mentioned and one small stove ad. A deplorable fact!

The Walden Hardware Company, 337 Central Avenue, is the owner of the ad, and to them is due great credit for their originality.

Due to its length and exceeding narrowness, however, we were unable to reproduce it, so we will give you an idea of how it looked.

The heading of the ad began:

"Today's story is about today. which is the day the hunting season opens to continue until February 15, 1924. We ask you to see our display of hunting needs in our west window. Last Saturday from 5 until 9 at night men stood three deep before this display in our hunting window."

This was set in large, bold faced type, with ample white space between the lines, each line containing not over two or three words.

The next paragraph in smaller type ran as follows:

"We believe they saw there the Heart of the Woods, which is reflected in the heart of all red-blooded men.

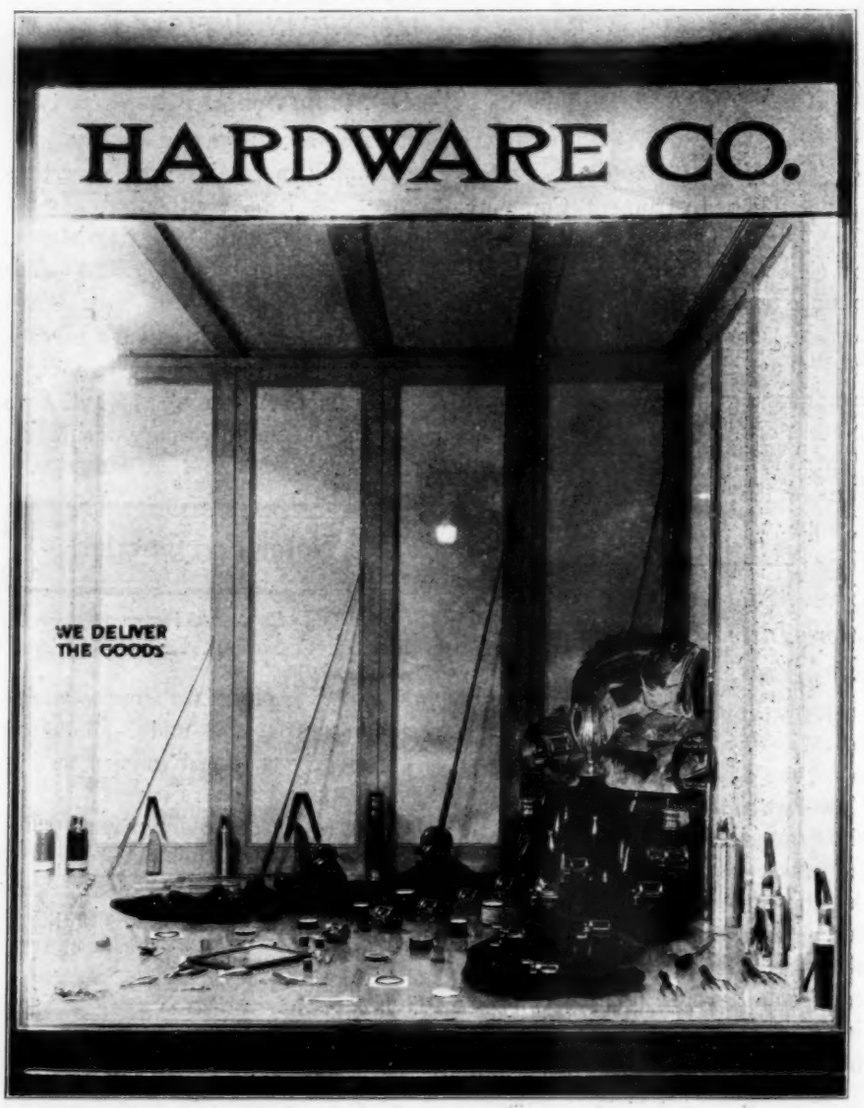
"The new windows have the background to give our boys a chance for artistic displays, and you will admit they have made the most of their opportunity in presenting a novel and attractive setting with little trace of artificial devices."

Then the copy ran on, talking about the shouldering of responsibility in the following fashion:

"We are shouldering a great deal of responsibility in inviting you to see this display, for it will doubtless start an exodus woodwards which will approximate the gold rush of 1849 and leave St. Petersburg bereft of its male citizenship for several days. But what difference will it make so long as they return more enthusiastic over their state and city than ever?

"Personally, we don't pretend to be a man of iron, and when we saw our own display and heard, as we always do at this time of year, the call of the woods, we just had to go hunting. So Jimmie Wade, freight agent of the Atlantic Coast Line, and I are on our way for a three days' hunting trip, and we are using the guns, the ammunition and all the other equipment that we suggest other hunters should use on these trips and which we have in stock."

The ad was then signed by Robert Walden, President and General Manager of the Walden Hardware



Display of Fishermen's Goods Which Brought Many Orders, Although There Are No Large Fishing Ponds in Immediate Vicinity of Store.

Company, 337 Central Avenue, and the statement to the effect that Mr. Walden backs up every statement made in his advertisements and that's why Blue List Service signs the advertisements with him with its blue list trade mark.

The blue list service trade mark was also shown in the ad.

Here is an instance of the proprietor showing real enthusiasm about the sporting goods department of his store; he himself uses the goods which he recommends others use and can talk with authority to the hunting fans.

More of this type of advertising will increase the number of converts in your way of thinking and incidently increase your profits.

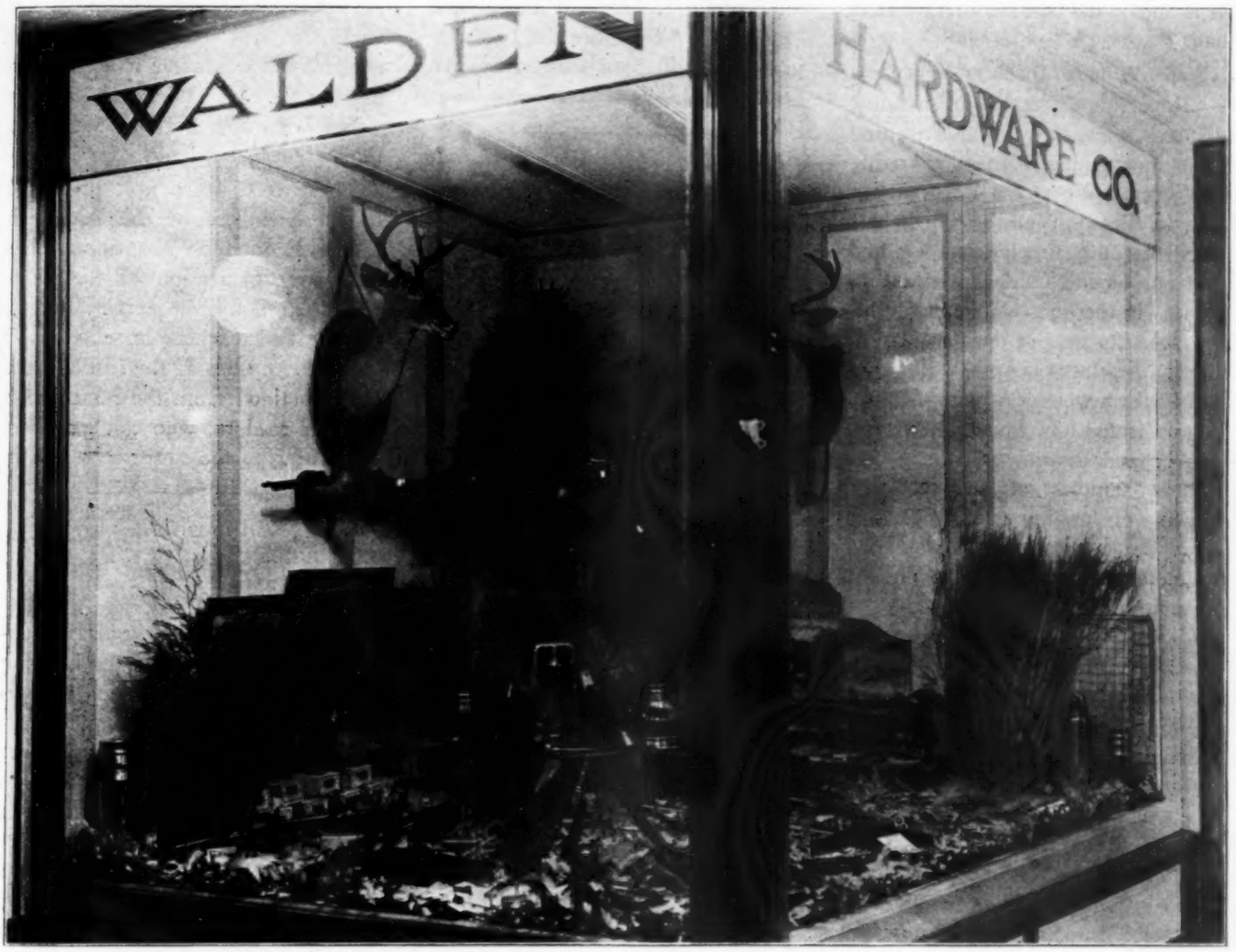
The following interesting comment from Robert Walden, Manager of the Walden Hardware Company, shows that business can be had if you go after it:

"We take a great deal of pride in our windows; every one of us in the store makes suggestions as to what we shall display, and out of all these suggestions, two of our young men produce displays that are acknowledged to be very attractive. Recently we kept a display of hunting goods in one window for more than a fortnight because it attracted so much attention from so many people. About everything that has to do with hunting was displayed and the combination was certainly splendid. Our young men installed colored lights that gave the green leaves of the South the color of autumn leaves in the North, which produced a very fine and pleasing effect.

"In the other window we display quite frequently all of the things that are needed for fishing trips.

"Our hunting and fishing windows appeal to the force in the store, because every one of us hunt and fish. When we go hunting we have to travel quite a distance from home, but it is worth while because there is no trouble to get all the quail, duck and wild turkey we want.

"As to fishing, the waters around St. Petersburg are alive with 294 varieties of game fish, and the best fishing grounds in the world can be reached in about an hour's motor boat trip from either St. Petersburg or Pass A Grille, made famous by John Wanamaker, who spent the last years of his life fishing in the waters thereabouts and winning prizes for big catches of king's fish and amberjack.



First-Class Window Display of Autumn and Winter Hunting Goods Arranged by Progressive Southern Hardware Store.

Describes Hunting Trip.

"The hunting trip you asked me to describe was not especially eventful, but we aways make it a rule when the hunting season opens to go away with a friend for three days for quail and duck.

"We left St. Petersburg the night before the hunting season opened and hunted three days and had wonderful luck. We killed our quota of quail every morning and spent the afternoon getting duck. There were plenty of duck, but it was difficult to get anywhere near them; however, we bagged all we wanted to eat in camp and had a fine lot to bring home with us. All of the hunters have had very good luck this season. It is one of the best seasons we have had.

Finds Window Displays Valuable.

"Reverting again to our window displays, we wish to say that we find them most valuable in popularizing our store. We pay a lot of attention to them. We always display lines that are timely and we find that our business shows marked increases in the lines we display.

"Recently we put on a display of Duplex Fireless Cookers, which continued for a week. A young woman demonstrated how to use the fireless cooker and distributed among customers samples of her cooking, which were mighty good. We sold more fireless cookers during that week than during any week in the history of our business.

"The sales this year to hunters have been larger than for years. Two reasons exist for these sales:

"First, we have adopted an advertising program which is followed out regularly in both of our home town newspapers every week; secondly, our advertising calls attention to our window displays, which furnish demonstrations of our ability to back up our advertising with the quality of the goods we handle.

"We know that it is worth while for us to maintain the character of our window displays and we regard our investment in making these windows attractive as one of the most profitable in our business."

When you have trusted a man you know to be poor pay, follow up the account promptly and persistently. You will show him that you are a good business man and you will discourage with any attempt to increase his indebtedness.

Frank Stockdale Will Discuss Profit-Making Turnover at Wisconsin Retail HardwareConvention.

Frank Stockdale, who has earned a high reputation as an authority on retail merchandising, will be one of the speakers at the Annual Convention of the Wisconsin Retail Hardware Association, February 6, 7 and 8, in the Milwaukee Auditorium.

"Profit Making Plans" and "Stock Turnover" are the two subjects that will be discussed by Mr. Stockdale.

Professor F. F. Good Finds New Selling Points on Cooking Utensils.

What talking points do you use in selling cooking utensils—enameled ware, for instance? Do you emphasize cleanliness, durability or some other quality? Do you point out how easy it is to clean or how its surface is not affected by acid foods?

Scientists at Columbia University, New York, have been investigating cooking utensils. At Teachers College, Columbia University, the greatest school of home economics in the country, probably the greatest in the world, they have made many scientific investigations of foods, cookery and utensils, the results of which have been adopted by housewives.

The latest investigation deals with the question of fuel economy—what kind of utensils should the housewife use if she wishes to save fuel? The results of these tests may be used very effectively in selling any woman, whether she brings up the point about saving fuel or not. The tests were made by Professor F. F. Good, in the physics laboratories of the School of Industrial Arts at Teachers College. Professor Good made a comprehensive series of tests in heating water in a number of aluminum and enameled ware stew kettles. Scientific accuracy ruled throughout—everything was measured carefully and all experimental factors checked up.

Professor Good found that the thermal efficiency (using new utensils) of aluminum ware ranged from 38.4 in light grade stamped ware to 38.7 in heavy grade cast ware. The thermal efficiency of enameled ware ranged from 42.8 in heavy grade ware to 43.1 in light grade ware. The average efficiency of aluminum ware was, therefore, found to be 38.6 and of enameled ware 43.0, or enameled ware is 11.4 per cent more efficient in saving fuel. He also found that a utensil is more efficient after it is "broken in"—in the case of enameled ware a vessel with the bottom blackened registered an efficiency of 44.7.

These tests were first presented to the members of the American Home Economics Association, the national organization of the thousands of home economic writers, experts and teachers in schools and colleges. Copies of the results have been obtained from the Association for our readers, who can get them by writing to the editor.

Are You Entitled to a Refund on Excess and War Profits Taxes?

Information on refunds on excess and war profits taxes is being distributed by F. D. Mitchell, Secretary-Treasurer American Hardware Manufacturers' Association.

The following letter of particulars regarding this information has been received from Secretary Mitchell:

"Upon excess and war profits taxes a refund may be obtained by those corporations that have paid a higher per cent of their net taxable income than the average per cent paid by other firms making a similar product.

"Perhaps you are entitled to a refund. We shall be glad to attempt to secure for you the information that will determine this.

"If you desire us to do this, kindly provide us with the percentages which your excess and war profit taxes (exclude normal income tax) bore to your net taxable income for the years 1918, 1919, 1920 and 1921. These percentages may be had from

the figures on your copy of your tax returns."

West Virginia Hardware Associatian to Convene at Huntington, January 15 to 18.

The Eighteenth Annual Convention and Exhibition of the West Virginia Hardware Association will be held at Huntington, West Virginia, January 15 to 18.

The reception of members will take place Tuesday morning, January 15, at which time registration, distribution of badges and tickets for entertainment will take place.

The meeting will come to order at 1:30 p. m. in the Exhibit Hall.

At 7.30 p. m. a meeting for all will be held in the Assembly Room of the Hotel Frederick, at which time W. H. Rallenbury, Vice-President of Landers, Frary & Clark, New Britain, Connecticut, will give an address on "Wife Saving Stations."

This address will be followed by dancing until 12.

The President's address and the reports of Secretary-Treasurer, Memorial committee and Legislative committee will be heard Wednesday morning, January 16.

A discussion led by George F. Pfarr, Akron, Ohio, President of Ohio Hardware Association, will be taken up. The discussion will be on "Does It Pay to Coöperate with Your Neighbor?"

The discussions to be taken up Thursday morning will concern themselves with "Store Arrangement and Pricing of Goods" and "What Is It You Want to Know About Your Business from Day to Day?"

The banquet for all members and ladies will be held at the Frederick Hotel at 6:30 p. m., followed by dancing.

Reports of the committees on Nominations and Resolutions will be made Friday morning at 9 a. m.

Untidiness in appearance will offset a good many very desirable qualities in a clerk, and yet it is the easiest fault to correct.

Business Cards Avoid Mis-spelled Names and Lend Dignified Appearance.

Visiting cards are as old as the gregarious instincts of mankind, and this instinct, so Professor James tells us, is one of the first to manifest itself in the new-born babe. The tomb of our much advertised and ancient friend, King Tutankhamen, or King "Tut," contained sufficient evidence to substantiate the fact that calling cards were in vogue in his day.

Hay Hardware Co.
Phone 332 — 75 Main Street

Builders' Hardware of Quality

A very important adjunct to the make-up of the up-to-date man of affairs today is his business card, carrying the name of the house which he represents as well as his own name. Salesmen of all kinds invariably carry their cards. It saves time and avoids awkward, embarrassing moments, as well as to insure the correctness of the spelling of names. Counter salesmen generally hand out their cards to patrons who have made purchases. This not only facilitates matters in the store, but very often customers take a fancy to a certain salesman and they can ask to have the same man wait on them at future occasions.

Hardware
Glass
Paint
D. E. BOSSART
1419 Ligonier St.

The three accompanying ads reprinted from newspaper advertisements could be very well adapted to salesmen's cards. These ads are all good, and it will be noted that they give but one specialty which the firm carries in addition to giving the name and address of the firm.

Buy Furniture and Hardware from Wolk's and Save Money!

Home Furniture & Hardware Store
(The Store of Quality)

Cor. Pittsburg and Peach Streets, Connellsville, Pa.
Tri-State Phone 466-W.

There are many different ways of arranging the name and other reading matter with which it is desired to adorn the card. The one point to bear in mind is that the cards should be plain and easy to read.

How We Respond to Bright Colors in Window Displays.

Bright colors attract attention because they are pleasing to the eye. A color clash also attracts the eye because it is inharmonious, but this latter attraction is undesirable because it grates upon the nerves in the same manner as do inharmonious or discordant sounds.

These scientific facts have been tested and proved and they have been found to be of inestimable value in all kinds of window trimming and other display work.

Various colors can be combined to create certain impressions and to lend a certain desired atmosphere to a setting. For instance, red and certain of its complements are combined for the setting of a festal display, while, on the other hand, purple and other dark colors lend a certain richness to the setting.

Passing a hardware store window the other day, I noticed that the floor of the window, the back and the one closed side were trimmed with a bright green velvet cloth.

Carpenters' and mechanics' tools were arranged very effectively in different shaped designs on both the floor and the background.

The window was illuminated by means of an indirect lighting system which made the entire setting very pleasing to the eye. In fact, although I am not an artisan using those tools and know very little about them, the sight was so pleasing to me that my eye remained fixed upon the setting until the display had completely disappeared from my range of vision. From this experience I can well understand how a person working with or having only an occasional use for tools of this kind would be influenced to step into the store and buy a hammer or screwdriver, the need of which having been called to his attention by the sight of the window.

Any standard Encyclopædia will give all the information one needs to know about correct color combinations to make an attractive window display. The colors you use, of course, will be determined by the purpose to be attained or the object in view.

An orderly and tidy looking window display, augmented by appropriate coloring matter, is not difficult to arrange, although it will require some intensive study. Do not let your windows become unsightly. They are the biggest asset you have in salesmanship. Be sure and wash them frequently and rearrange them about once a week.

No man is a failure until he has lost his cheerfulness, his optimistic outlook. The man who does his best and carries a smiling face and keeps cheerful in the midst of discouragements, when things go wrong and the way is dark and doubtful, is sure to win.

Coming Conventions

Western Retail Implement and Hardware Association, Missouri Theater Building, Kansas City, January 15, 16, 17, 1924. H. J. Hodge, Secretary-Treasurer, Abilene, Kansas.

The West Virginia Retail Hardware Association Convention and Exhibit, Huntington, West Virginia, January 15 to 18, 1924. James B. Carson, Secretary-Treasurer, 1001 Schwind Building, Dayton, Ohio.

Mountain States Hardware and Implement Association Convention, City Auditorium, Denver, Colorado, January 22-24, 1924. W. W. McAlister, Secretary-Treasurer, Boulder, Colorado.

Kentucky Hardware and Implement Association, Louisville, January 22-25, 1924. J. M. Stone, Secretary-Treasurer, 202 Republic Building, Louisville.

Sheet Metal Contractors' Association of Indiana, Hotel Severin, Indianapolis, January 29 and 30. Leslie W. Beach, Richmond, Indiana, is Secretary.

Indiana Retail Hardware Association, Inc., Convention and Exhibition, Cadle Tabernacle, Indianapolis, January 29, 30, 31, February 1, 1924. G. F. Sheely, Secretary, Argos.

Nebraska Retail Hardware Association, Lincoln, Nebraska, February 5 to 8, 1924. George H. Dietz, Lincoln Nebraska, Secretary-Treasurer.

Wisconsin Retail Hardware Association Convention and Exhibition, Milwaukee Auditorium, February 6, 7, 8, 1924. George W. Kornely, Manager of Exhibits, 1476 Green Bay Avenue, Milwaukee. P. J. Jacobs, Secretary-Treasurer, Stevens Point.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, February 12, 13, 14, 1924. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

Iowa Retail Hardware Association, Des Moines, Iowa, February 12, 13, 14 and 15, 1924. A. R. Sale, Secretary-Treasurer, Mason City, Iowa.

The Pennsylvania and Atlantic Seaboard Hardware Association, Incorporated, Convention and Exhibition at the Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14 and 15, 1924. Sharon E. Jones, Secretary-Treasurer, Wesley Building, Philadelphia.

Illinois Retail Hardware Association, Hotel Sherman, Chicago, Illinois, February 18 and 19, 1924. Leon D. Nish Secretary-Treasurer, Elgin, Illinois.

Ohio Hardware Association, Convention and Exhibition, Cincinnati, Ohio, February 19, 20, 21 and 22, 1924. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

New York Retail Hardware Association Convention and Exhibition, February 19, 20, 21, 22, 1924. Headquarters, McAlpin Hotel, and exhibition at Seventy-first Regiment Armory. John B. Foley, Secretary, 412-413 City Bank Building, Syracuse, New York.

New England Hardware Dealers' Association Convention and Exhibition, Mechanics' Building, Boston, February 20, 21, 22, 1924. George A. Field, Secretary, 10 High Street, Boston, Massachusetts.

North Dakota Retail Hardware Association Convention and Exhibition, Municipal Auditorium, Fargo, February 20, 21, 22, 1924. C. N. Barnes, Secretary, Grand Forks.

Michigan Sheet Metal and Roofing Contractors' Association, February 25 to 28, 1924, Hotel Kerns, Lansing. F. E. Ederle, Secretary, 1121 Franklin Street, S. E., Grand Rapids, Michigan.

Missouri Retail Hardware Association Convention and Exhibition, Marquette Hotel, St. Louis, February 26, 27 and 28, 1924. F. X. Becherer, Secretary, 5106 North Broadway, St. Louis.

Minnesota Retail Hardware Association Convention and Exposition, St. Paul Auditorium, February 26, 27, 28, 29, 1924. C. H. Casey, Secretary, Jordan, Minnesota.

California Retail Hardware Implement Association Convention and Exhibition, Civic Auditorium, San Francisco, March 18, 19, 20, 21, 22, 1924. LeRoy Smith, Treasurer, 112 Market Street, San Francisco.

Southeastern Retail Hardware and Implement Association, composed of Alabama, Florida, Georgia and Tennessee, Convention and Exhibition, Atlanta, Georgia, May 27, 28, 29, 1924. Walter Harlan, Secretary, 701 Grand Theater Building, Atlanta.

Hardware Association of the Carolinas Convention, Wrightsville Beach, North Carolina, June 17, 18, 19, 1924. T. W. Dixon, Secretary-Treasurer, 717-718 Commercial Bank Building, Charlotte, North Carolina.

South Dakota Retail Hardware Association and Exposition, Coliseum Building, Sioux Falls, March 4, 5, 6, 7, 1924. C. H. Casey, Secretary, Jordan, Minnesota.

Spring Convention of American Hardware Manufacturers' Association, Roosevelt Hotel, New Orleans, Louisiana, April 8, 9, 10 and 11, 1924. Frederick D. Mitchell, Secretary-Treasurer, 1819 Broadway, New York City.

Annual Convention of Southern Hardware Jobbers' Association, April 8, 9, 10 and 11, 1924, at Roosevelt Hotel, New Orleans, Louisiana. John Donnan, Secretary-Treasurer, Room 821, American National Bank Building, Richmond, Virginia.

Retail Hardware Doings

Illinois.

William J. Tex has sold his hardware store at Owaneco to G. M. Long.

Indiana.

Max Bailey is the new owner of the Bailey and Son hardware store at Rochester.

Iowa.

G. A. Bonnewell of Des Moines has purchased the Parson's Hardware Company of Perry.

Nebraska.

C. J. Werner has sold his hardware store at Wymore to Roy Howe of Barneston.

Oregon.

D. J. Murphy has sold his interest in the Murphy and Starr hardware business at Silverton to his partner, J. S. Starr. The business will now be known as the Starr Hardware Company.

Texas.

H. C. Hafer has purchased an interest in the Holle Hardware Company at Brenham.

Wisconsin.

Messrs. John V. Zweck, J. C. Wollenburg, C. J. Haider and J. M. Klein have formed the Zweck-Wollenburg Company, Incorporated, at Beaver Dam. This will give Beaver Dam the county's largest hardware store.

Dufendach Hardware Stresses Economy in Making Stove Sales.

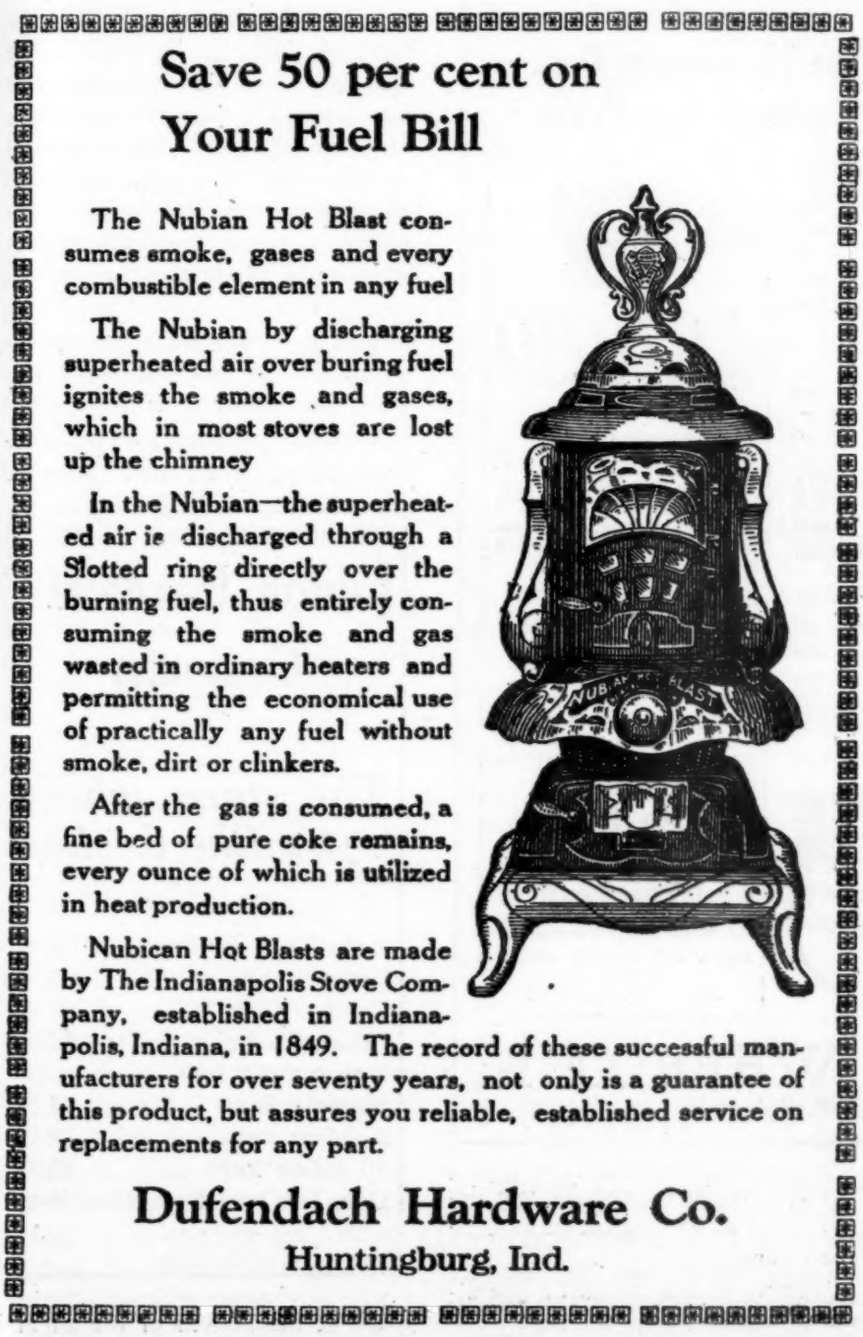
Every good advertisement must contain a headline, illustration and reading matter which are correlated and which dwell continually upon some specific feature of the article advertised. That feature may be a fuel saver, as in the advertisement shown herewith, or labor saver not found in any of its competitors, or the article may perform a specific task better and more economically than other articles of the same nature.

It is the object of the advertisement to enlighten the prospective customer on these essential points of the article and to emphasize them, but not to exaggerate them nor to bear false statements concerning the article.

The advertisement should bring out in dollars and cents the advantages of the advertised article and that is exactly what the Dufendach Hardware Company, Huntingburg, Indiana, have done in advertising the Nubian Hot Blast Stove.

The keynote of this advertisement is economy of fuel and it is well worked out. The headline introduces the subject with a thought which is bound to attract attention. Each successive paragraph in the reading matter enlarges upon the method of introducing the superheated air which consumes the unburned volatile gases as they arise from the hot bed of coals.

A mis-spelled word appears in the last paragraph of the ad.


Save 50 per cent on
Your Fuel Bill
The Nubian Hot Blast consumes smoke, gases and every combustible element in any fuel
The Nubian by discharging superheated air over buring fuel ignites the smoke and gases, which in most stoves are lost up the chimney
In the Nubian—the superheated air is discharged through a Slotted ring directly over the burning fuel, thus entirely consuming the smoke and gas wasted in ordinary heaters and permitting the economical use of practically any fuel without smoke, dirt or clinkers.
After the gas is consumed, a fine bed of pure coke remains, every ounce of which is utilized in heat production.
Nubican Hot Blasts are made by The Indianapolis Stove Company, established in Indianapolis, Indiana, in 1849. The record of these successful manufacturers for over seventy years, not only is a guarantee of this product, but assures you reliable, established service on replacements for any part.
Dufendach Hardware Co.
Huntingburg, Ind.

Dufendach Hardware Company Increases Its Stove and Range Sales by Featuring Economy of Fuel.

Who Makes "Our Own" Water Heater?

To AMERICAN ARTISAN:

Can you tell us who makes "Our Own" water heater?

Yours truly,
WEST SIDE HARDWARE.
———, Illinois, January 3, 1924.

Just Making a Living Is Not Main Object of Man; Make a Life.

There is a higher meaning, something broader, deeper and nobler, in a vocation than making a living or seeking fame. Making a life is the best thing in it. It should be a man-developer, a character-builder, and a great life school for broadening, deepening and rounding into symmetry, harmony and beauty all the God-given faculties within us.

Character and Ability Are Most Important Factors in Credit.

Credit is 80 per cent character and ability. The public estimate of character and ability is reputation. Reputation is estimated by public knowledge. Truthful advertising, properly backed up by goods and service, adds to the reputation for character and ability.

The third element in credit is capital. The profitable employment of capital is turnover. Judicious advertising increases turnover and thereby increases capital and strengthens credit.

What is the percentage of your sales, spent for advertising?

Timely Suggested Uses for Advertised Articles Most Powerful Retail Sales Maker.

Function of Retail Store Is to Render Service and Making Timely Helpful Suggestions Is a Service of High Merit.

A 6⅜ x 8¾-inch advertisement appearing in the South Bend, Indiana, *Times* demonstrates the advisability of always stressing the utility value of the article offered. This advertisement is reproduced herewith.

Wheelock & Company Wheelock & Company

Timely Articles on Sale in The Housewares Dept—Third Floor—And at Interestingly Low Prices

PORTABLE ELECTRIC HEATERS

bring quick warmth on chilly mornings. They take the chill from the nursery, sewing room or bath and can also be used for drying the wash or the children's rain-soaked garments on stormy days.

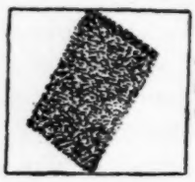
Style illustrated $7.50.

ASH CANS FOR THE FURNACE ROOM

A large size corrugated can and cover durably constructed. at $3.00.

WITT ASH CANS

No. 1 size, 20 gal. capacity, $5.00; No. 2 size, 27 gal. capacity, $6.00.



COCOA FIBRE DOOR MATS

They will save the rugs and carpets by preventing dirt and moisture from being tracked into the house.

3 Sizes, Priced at $1.50, $1.75, $2.00.

YELLOW MIXING BOWL SETS

An excellent kitchen utility. These bowls are first quality yellow ware with white bands. The set of four measure 4½, 6½, 8½ and 10½ inches in diameter.

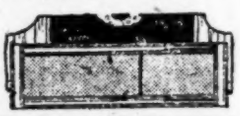
Complete Set $1.00.

MIRRO

The Finest Aluminum

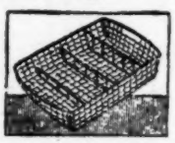
A 2-quart Mirro Aluminum Percolator at $1.69

This item is the one that you have seen advertised. It is the colonial style, has the new flame guard handle and sells regularly for $2.35.



WINDOW VENTILATOR

to keep out drafts and rain.
Size 8x20 inches.....70c.
Size 16x20 inches.....$1.10.



A WIRE DISH DRAINER

makes dish washing efficient. 3 Sizes at $1.25, $1.50, $1.75.

GEORGE H WHEELOCK & COMPANY

Note the description of the portable electric heater. Suggesting uses for the article is one of the most powerful sales makers.

In offering a door mat, the store calls attention to the saving of the house rugs to be effected by placing the mat outside. All of these suggestions lend force to the advertisement, because of their power over the mind of the prospective customer.

In suggesting through its advertising new and unthought of uses for the articles offered for sale lies the power of the retail store to serve the community.

The ways and means of appealing to human nature are many, and the study of human psychology is one of the most productive means of spending one's time. This does not mean book study entirely, but rather the study of the customers as they present themselves before you.

* * *

There has been a great deal written and said about the feasibility of quoting prices in an ad. Next to the headline and the illustration, the quoting of prices in the reading matter of an ad is third in importance. If you read an ad where there are no prices quoted, the ad does not interest you nearly as much as one where you can see at a glance whether or not you can get a bargain.

The accompanying ad appearing in the Linton, Indiana, *Citizen* is a good example of price quotations.

Perhaps it would have been more desirable to have placed the name plate at the bottom of the ad and used some catchy phrase for the headline.

Linton Hardware Company

The store where you like to shop

Auto Vacuum Freezers	$6.00
Croquet sets	$2.50
Porch swings	$3.75
Guaranteed electric iron	$4.85
Mason fruit jars	85c
Electric fans	$5.00
5-gallon kegs	$2.75
10-gallon kegs	$3.50
One, two and five-gallon kegs	

Basic Conditions Admittedly Sound—Three Basic Barometric Industries Show Signs of Life.

New Business in Non-Ferrous Metals Is Light—Little Change In Copper—Tin Goes Up—Zinc Stronger.

TRADE has entered 1924 with a more confident step. Forecasts have been largely cheerful, and basic conditions admittedly are sound. With the passing of the year-end lull various important lines are resuming at the pre-holiday rate or better.

Three basic and barometric industries are giving signs of life. They are iron and steel, building and automobiles. Of these the automobile industry is holding the center of the stage, with the launching of January motor shows. These shows will indicate the tendency and probable volume of demand. Manufacturers feel assured of a big year and are in the market for steel to meet requirements for expanded production schedules.

All signs point to a substantial building year in 1924. The Copper and Brass Research Association estimates the total volume of construction in 1923 at $5,022,900,000. It forecasts a 1924 total of $4,835,935,000, or 18 per cent less than last year. This total, however, would rank the year as one of the largest on record.

Copper.

In the outside copper market there was a little more inquiry, especially for shipment into the interior in February, March and April, but little business was transacted. The tone of the market was weaker in sympathy with the decline in producers' prices.

Most second hands were asking 12.75 cents f. o. b. refinery for prompt, January, February and March shipment. Possibly this price could be shaded five points for prompt shipment, but the March position is relatively firmer than January and February.

Second quarter position is difficult to buy at 12.87½ cents and third quarter at 13 cents to 13.12½ cents. Buyers and sellers, however, are apart five to ten points.

Lake copper is difficult to sell at 13 cents delivered for nearby shipment, and casting copper is dull and easy at 12.50 cents f. o. b. refinery.

Tin.

The tin market was in a lifeless condition January 8 until late in the afternoon, when large purchases were made by dealers and operators at from 46.90 cents up to 47.25 cents for future Straits, which resulted in nearly all of the foreign limits being sold.

The New York market has been in a fairly active condition and sales of Straits tin have been made at 48 cents for prompt deliveries, 47.87½ cents for January, 46.62½ cents for February and March. At the second call on the New York Metal Exchange one lot of December-January shipment from the Straits was sold at 47.50 cents, but this price was bid for more and with limited offerings at 47.62½ cents.

There has been a certain amount of buying by consumers, but as was the case yesterday, the major operations represented purchases by dealers.

Chicago price of tin has increased to $50.00 for pig tin and $52.00 for bar tin per hundred pounds.

Zinc.

The zinc market has continued to suffer from an excess of producing capacity, and as both mining and smelting operations can be expanded in short order, the industry has been continually threatened with an oversupply. This was the condition throughout the last half of 1923 and although domestic consumption was excellent, supplies were in excess of demand and prices declined with the increase in surplus stocks.

The gain in stocks amounted to only a little over 20,000 tons, and at the end of the year they were equivalent to less than a month's deliveries, but as the movement is upwards and as smelters are always slow in the matter of curtailing, they have served to act as a damper on the market.

The Chicago price of slab zinc has increased to $9.75. The price of sheet zinc as reported by Matthiessen-Hegeler Zinc Company, La Salle, Illinois, is $9.50 per hundred pounds.

Lead.

The position of lead is strong on the basic conditions of supply and demand. The situation can be summed up in the simple statement that consumption is exceeding production and there is no relief at present in sight.

Stocks are negligible and the producers not only have no surplus, but for the most part have been for a long time behind in their contract deliveries.

The Chicago price of American pig is 8.60 cents; bar, 9.75 cents.

Solder.

Chicago warehouse prices on solder are as follows: Warranted, 50-50, $30.75; Commercial, 45-55, $30.00, and Plumbers', $28.75, all per 100 pounds.

Wire and Nails.

Makers of wire and wire products are not flooded by the rush of post-holiday business, but they find marked improvement in demand for all classifications. This increase is especially noted in the manufacturing trade. Woven wire fence demand has increased. Operations still are at about 75 per cent of capacity, but an increase seems warranted. Jobbers are buying more liberally. Prices are unchanged.

Bolts and Nuts.

The leading maker of bolts and nuts reports specifications and new business good. Some makers are somewhat pressed for business, but demand generally for bolts and nuts is heavy. Automotive interests are good buyers. Prices in the Chicago district are firm at 60 and 10 off as the base, but rivet prices are somewhat shaky owing to competition to the East.

Sheets.

Makers of steel sheets are not being swamped by the inrush of first quarter business, but the steady flow of medium size orders from miscellaneous sources is satisfying. Most makers are booked about 70 to 75 per cent of capacity for the first quarter of 1924. Prices are firm at 3.00 cents, Pittsburgh, for blue annealed, 3.85 cents for black and 5.00 cents for galvanized. The Inland Steel Company is now directing all operations and sales of the Milwaukee Rolling Mill Company, which it has acquired as of January 1.

Tin Plate.

The domestic market on tin plate continues strongly fortified by reason of heavy tonnages booked for delivery over the first half, with actual specifications in the hands of makers.

March specifications are not due until January 15 and before this time next week these undoubtedly will have been received.

Tonnages of tin plate for case oil goods have been offered here on a re-export basis at prices below the $5.50 per base box, Pittsburgh level, but have been refused. One involving 60,000 base boxes offered at $5.41½ and $5.30 is understood to have been taken by an eastern Pennsylvania tin plate maker at the latter level.

Lower prices prevail on tonnages of this character because some of the freight rate is refunded upon presentation of documentary evidence that the material finally is shipped abroad, as is true of case oil.

Operations fast are returning to the averages maintained prior to the holidays. The American Sheet & Tin Plate Company starts this week on a 97 per cent basis and independents are averaging around 90 per cent.

Old Metals.

Wholesale quotations in the Chicago district, which should be considered as nominal, are as follows: Old steel axles, $17.50 to $18.00; old iron axles, $26.00 to $26.50; steel springs, $19.25 to $19.75; No. 1 wrought iron, $15.50 to $16.00; No. 1 cast, $18.00 to $18.50, all per net tons. Prices for non-ferrous metals are quoted as follows, per pounds: Light copper, 9½ cents; light brass, 6 cents; lead, 4¾ cents; zinc, 4 cents, and cast aluminum, 15 cents.

Cheerful Tone Pervades Pig Iron Market; Operations Again on Increase.

Sales Are Few in the Pittsburgh District—Current Chicago Business at $23.50—Birmingham Quotations Still at $21.

REPORTS of some large purchases of basic iron and other grades at Pittsburgh have enlivened an otherwise quiet but steady pig iron market. Recent sales of 25,000 tons by a middleman at $21, valley, apparently establish basic at that figure, though some makers since have quoted $22.

A current report that the leading steel interest has purchased 50,000 tons of basic at Pittsburgh is denied. A Pittsburgh buyer bought 10,000 tons of malleable and also 10,000 tons of foundry iron, both at $22, valley. Shipments of iron have been moving more briskly from the furnaces to consumers.

Although a fair amount of business has been done since January 1, the pig iron market still is sluggish compared to pre-holiday activity. Much more interest is manifested in the second quarter. All current business is at $23.50, furnace, with some second quarter selling at this price. A Chicago melter is inquiring for 150 tons of foundry for second quarter. An Indiana melter wants 1,000 tons of foundry for first quarter. The southern spread still is $21 to $22, Birmingham, with one large producer asking $21.50. Sales are confined to small lots. Charcoal iron is going in carloads at $26, furnace. Inquiries for low phosphorus and silvery iron are limited.

Southern furnace interests are shipping pig iron on contracts previously made, but new selling is in small lots. Quotations still hold at $21 to $21.50 per ton, with the latter paid by local consumers and those buying in lots of from one to three or five cars at a time.

* * *

Advertising serves two purposes. It nets returns in Good Will and Sales. No store can go very far without customer good will. Advertising helps build up that prestige for a store which makes it different from others. It helps to establish its character in the public mind. It does it many times quicker and reaches far more people than could be accomplished by the store without its aid. It is quite possible for a new store to come into a community of old established stores and through advertising build up a standing and acquaintanceship with the trade equal to that of the oldest establishments there; in fact, it is being done every day. This is a world where we get things by going after them.

Next, and of equal importance, advertising increases turnover. It makes many sales when there would have been few. Instead of increasing prices it can actually lower them. Paradoxical as it may seem, up to a certain limit, the money spent on advertising actually reduces costs. It reduces costs by increasing turnover without increasing overhead expense in any like proportion.

Memorial Monuments

Write for Prices and Illustrations

Gerock Bros. Mfg. Co.

Sheet Metal Ornaments and STATUARY

1252 So. Vandeventer Ave.

St. Louis, Mo., U. S. A.

EVERYTHING
FOR THE TINSMITH

WE are manufacturers as well as merchants and we at all times have on hand a large complete stock of everything that you may be in need of.

Try us on your next order.

This is our motto:

"EVERYTHING MUST BE RIGHT"

Write today for our latest catalog

BERGER BROS. CO.

229 to 237 ARCH STREET

WAREROOMS AND FACTORY: 100 TO 114 BREAD STREET

PHILADELPHIA, PA.

2

CORTRIGHT
METAL SHINGLE

Dipped in Molten Zinc after being cut and formed.

This gives

Cortright Hand Dipped Shingles

a coating on all edges as well as both sides. We will be glad to send our book, "Concerning That Roof."

It describes all the various patterns we make and all the different kinds of materials used.

CORTRIGHT METAL ROOFING CO.

Philadelphia *Chicago*

STANDARD SINCE 1887

"As Soft as an INLAND SHEET"

The Sheet Metal Shop's

Standard of Comparison

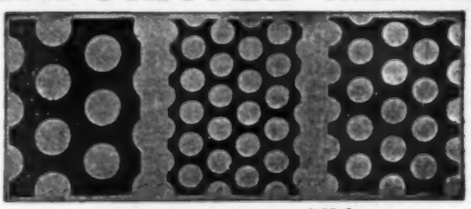
INLAND STEEL COMPANY

38 South Dearborn St., Chicago

Works:
Indiana Harbor, Ind.
Chicago Heights, ILL.

Branch Offices
Milwaukee St. Louis
St. Paul

PERFORATED METALS



All Sizes and Shapes of Holes

In Steel, Zinc, Brass, Copper, Tinplate, etc.

For All Screening, Ventilating and Draining

EVERYTHING IN PERFORATED METAL

THE HARRINGTON & KING PERFORATING CO.

5649 FILLMORE ST.-CHICAGO, ILL., U. S. A.

NEW YORK OFFICE, 114 LIBERTY ST.

CHICAGO STEEL SLITTING SHEAR

LIGHT—POWERFUL DURABLE

Capacity 10 gauge sheets
Any Length or Width
Flat Bars 3/16 x 2"
Weight 22 pounds

Price $12.50 Net

F. O. B. Chicago

Made of pressed steel and equipped with hold-down. Blades of highest grade crucible steel Most indispensable high grade shears made. Equal to other shears selling at over twice the price. *ORDER YOURS TODAY*

DREIS & KRUMP MFG. CO., 2915 S. Halsted St., Chicago

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry	23 00 to 23 50
Southern Fdy. No. 2	27 01 to 28 01
Lake Sup. Charcoal	29 04
Malleable	23 00 to 23 50

FIRST QUALITY BRIGHT TIN PLATES.

		Per Box
IC	14x20 112 sheets	$12 45
IX	14x20	14 05
IXX	14x20 56 sheets	17 57
IXXX	14x20	18 12
IXXXX	14x20	18 65
IC	20x28 112 sheets	27 50
IX	20x28	29 85
IXX	20x28 56 sheets	16 15
IXXX	20x28	17 20
IXXXX	20x28	18 25

TERNE PLATES.

		Per Box
IC 20x28, 40-lb.	112 sheets	$25 60
IX 20x28, 40-lb.	" "	28 50
IC 20x28, 30-lb.	" "	21 80
IX 20x28, 30-lb.	" "	24 70
IC 20x28, 25-lb.	" "	20 80
IX 20x28,25 lb.	" "	23 70
IC 20x28, 20-lb.	" "	18 30
IV 20x28, 20-lb.	" "	21 15
IC 20x28, 15-lb.	" "	17 05
IC 20x28, 12-lb.	" "	15 75
IC 20x28, 8-lb.	" "	14 05

COKE PLATES.

Cokes, 80 lbs., base, 20x28.	$13 85
Cokes, 90 lbs., base, 20x28.	14 10
Cokes, 100 lbs., base, 20x28.	14 45
Cokes, 107 lbs., base, IC 20x28	14 85
Cokes, 135 lbs., base, IX 20x28	17 40
Cokes, 155 lbs., base, 56 sheets	9 75
Cokes, 175 lbs., base, 56 sheets	10 65
Cokes, 195 lbs., base, 56 sheets	11 70

BLUE ANNEALED SHEETS.

Base ..... per 100 lbs.	$3 50

ONE PASS COLD ROLLED BLACK.

No. 18-20 ..... per 100 lbs.	$4 50
No. 22-24 ..... per 100 lbs.	4 55
No. 26 ..... per 100 lbs.	4 60
No. 27 ..... per 100 lbs.	4 65
No. 28 ..... per 100 lbs.	4 70
No. 29 ..... per 100 lbs.	4 75

GALVANIZED.

No. 16 ..... per 100 lbs.	$5 10
No. 18-20 ..... per 100 lbs.	5 25
No. 22-24 ..... per 100 lbs.	5 40
No. 26 ..... per 100 lbs.	5 55
No. 27 ..... per 100 lbs.	5 70
No. 28 ..... per 100 lbs.	5 85
No. 30 ..... per 100 lbs.	6 35

BAR SOLDER.

Warranted.	
50-50 ..... per 100 lbs.	30 75
Commercial.	
45-55 ..... per 100 lbs.	30 00
Plumbers ..... per 100 lbs.	28 75

ZINC.

In Slabs	7 45

SHEET ZINC.

Cask lots, stock, 100 lbs...	11 00
Less than cask lots, 100 lbs.	11 50

BRASS.

Sheets, Chicago base	19¾c
Mill Base	17¾c
Tubing, brazed, base	25¾c
Wire, base	18¼c

COPPER.

Sheets, Chicago, base	20¾c
Mill base	20c
Tubing, seamless, base	24c
Wire, No. 9 & 10 B. & S. Ga.	17¾c
Wire, No. 11, B. & S. Ga.	17¾c

LEAD.

American Pig	$8 60
Bar	9 75
Sheet.	
Full Coils ..... per 100 lbs.	10 75
Cut Coils ..... per 100 lbs.	11 75

TIN.

Pig Tin ..... per 100 lbs.	50 00
Bar Tin ..... per 100 lbs.	52 00

HARDWARE, SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.	
Barton's	Net
White's	Net

AMMUNITION.

Shells, Loaded, Peters.	
Loaded with Black Powder	18%
Loaded with Smokeless Powder	18%
Winchester.	
Smokeless Repeater Grade	20 & 4%
Smokeless Leader Grade	20 & 4%
Black Powder	20 & 4%
U. M. C.	
Nitro Club	20 & 4%
Arrow	20 & 4%
New Club	20 & 4%
Gun Wads—per 1000.	
Winchester 7- 8 gauge	10&7½%
" 9-10 gauge	10&7½%
" 11-28 gauge	10&7½%

ASBESTOS.

Paper up to 1/16	6c per lb.
Rollboard	6¼c per lb.
Millboard 3/32 to ⅛	6c per lb.
Corrugated Paper (250 sq. ft. to roll)	$6.00 per roll

AUGERS.

Boring Machine	40&10%
Carpenter's Nut	50%
Hollow.	
Stearns, No. 4, doz	$11 50
Post Hole.	
Iwan's Post Hole and Well	35%
Vaughan's, 4 to 9 in	$15 60

AXES.

First Quality, Single Bitted (unhandled), 3 to 4 lb., per doz	$14 00
Good Quality, Single Bitted, same weight, per doz.	13 00

BARS, CROW.

Steel, 4 ft., 10 lb	$ 80
Steel, 5 ft., 18 lb	1 40
Pinch Bars, 5½ ft., 24 lb	1 60

BARS, WRECKING.

V. & B. No. 12	$0 34
V. & B. No. 24	0 43
V. & B. No. 324	0 57
V. & B. No. 30	0 48
V. & B. No. 330	0 63

BITS.

All Vaughan and Bushnell.	
Screw Driver, No. 30, each.	$ 27
Screw Driver, No. 1, each.	16
Reamer, No. 80, each	41
Reamer, No. 100, each	41
Countersink, No. 13, each	20
Countersink, Nos. 14-15, each	27

BLADES, SAW.

Wood.

Atkins 30-in.			
Nos.	6	40	26
	$8 90	$9 45	$5 40

BLOCKS.

Wooden	45%
Patent	45%

BLOW TORCHES (See Firepots).

BOARDS.

	Per Doz.
Stove.	
Crystal, 33"	$23 90
Wash.	
No. 760, Banner Globe (single) ..... per doz.	$5 25
No. 652, Banner Globe (single) ..... per doz.	6 75
No. 801, Brass King, ... per doz.	8 25
No. 860, Single—Plain Pump	6 25

BOLTS.

Carriage, Machine, etc.	
Carriage, cut thread, ⅝x6 and sizes smaller and shorter	50%
Carriage sizes, larger and smaller and shorter	50-10%
Machine, ⅝x4 and sizes smaller and shorter	50-5%
Machine, sizes larger and longer than ⅝x4	50-10-5%
Stove	70-10%

BRACES, RATCHET.

V. & B. No. 444 8 in.	$4 54
V. & B. No. 222 8 in.	3 89
V. & B. No. 111 8 in.	3 55
V. & B. No. 11 8 in.	3 02

BRUSHES.

Hot Air Pipe Cleaning.	
Bristle, with handle, each.	$0 85
Flue Cleaning.	
Steel Only, each	$1 25

BURRS.

Copper Burrs only	40%

BUTTS.

Steel, antique copper or dull brass finish—case lots— 3½x3½—per dozen pairs	$3 12
4x4 .... " " "	4 00
Heavy Bevel steel inside sets, case lots— ..... per dozen sets	7 80
Steel bit keyed front door sets, each	1 90
Wrought brass bit keyed front door sets, each	3 25
Cylinder front door sets, each	7 50

CEMENT, FURNACE.

American Seal, 5 lb. cans, net	$ 45
" " 50-lb. cans, "	90
" " 25 lb. cans, "	2 00
Asbestos, 5 lb. cans, net	45
Pecora ..... per 100 lbs.	7 51

CHAINS.

Sher. Steel Safety Chain.	
500-ft. coil, per ft.	.01½
100 to 500 ft., per ft.	.02
Less than 100 ft., per ft.	.02½
Iron Jack Chains.	
Box (12 yds.)	45

CHIMNEY TOPS.

Iwan's Complete Rev. & Vent.	30%
Iwan's Iron Mountain only	35%
Standard	30 to 40%

CHISELS.

Cold.	
V. & B. No. 25, ¼ in., each	$0 26
V. & B. No. 25, ⅜ in., each	41
Diamond Point.	
V. & B. No. 55, ¼ in.	0 31
V. & B. No. 55, ½ in.	0 48
Firmer Bevelled.	
Round Nose.	
V. & B. No. 65, ¼ in.	0 29
V. & B. No. 65, ½ in.	0 40
Socket Firmer.	
Cape.	
V. & B. No. 50, ⅜ in.	0 31
V. & B. No. 50, ¾ in.	0 57

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers	List less 35-40%
Yankee, for Yankee Screw Drivers	$6 00

CLAMPS.

Adjustable.	
No. 100, Door (Stearns) doz.	$22 00
Carpenters'.	
Steel Bar	List price plus 20%
Hose.	
Sherman's brass, ¾-inch per doz.	$0 48
Double, brass, ¾-inch, per doz.	1 20

CLINKER TONGS.

Front Rank, each	$1 75
Per doz.	18 00

CLIPS.

Damper.	
Acme, with tail pieces, per doz.	$1 25
Non Rivet tail pieces, per doz.	25

COPPERS—Soldering.

Pointed Roofing.

3 lb. and heavier ... per lb.	40c
2½ lb. ... "	45c
2 lb. ... "	48c
1½ lb. ... "	55c
1 lb. ... "	60c

CORD.

No. 7 Std. per doz. banks	$11 00
No. 8 " " " "	12 60

CORNICE BRAKES.

Chicago Steel Bending.	
Nos. 1 to 6 B	10%

COUPLING HOSE.

Brass ..... per doz.	$2 20

CUT-OFFS.

Kuehn's Korrekt Kutoffs: Galv., plain, round or cor. rd.	
Standard gauge	40%
26 gauge	10%

DAMPERS.

"Yankee" Hot Air.	
7 inch, each 20c, doz	$1 75
8 " " 25c, "	2 40
9 " " 30c, "	2 75
10 " " 32c, "	3 00
Smoke Pipe.	
7 inch, each	$ 35
8 " "	40
9 " "	50
10 " "	60
12 " "	90
Reversible Check.	
8 inch, each	$1 50
9 " "	1 70

DIGGERS.

Post Hole.	
Iwan's Split Handle (Eureka)	
4-ft. Handle ... per doz.	$14 00
7-ft. Handle ... per doz.	36 00
Iwan's Hercules pattern, per doz.	14 90

DRILLS.

V. & B. Star, 12-inch Length.	
¼, 5/16 and ⅜, each	$ 25
⅝, each	36
1, each	54
1¼, each	81
V. & B. Star, 18-inch Length.	
5/16 and ⅜, each	$ 33
⅝, each	45
1, each	69
1¼, each	1 05

EAVES TROUGH.

Milcor	
Galv. Crimpedge, crated	75%

ELBOWS—Conductor Pipe.

Milcor	
Galv., plain or corrugated, round flat	
Crimp, Std. gauge	65%
26 Gauge	40%
24 Gauge	10%
Square Corrugated.	
Milcor	
Standard gauge	45%
26 gauge	30%
Portico Elbows.	
Standard Gauge Conductor Pipe, plain or corrugated.	
Not nested	70 & 5%
Nested solid	70 & 5%

ELBOWS—Stove Pipe.

1-piece Corrugated.	Uniform. Doz.
5-inch	$1 45
6-inch	1 60
7-inch	2 10
Special Corrugated.	Doz.
6-inch	$1 45
7-inch	1 75

ART METAL CEILINGS AND SIDE WALLS

QUALITY—DURABILITY—BEAUTY

Are thoroughly combined in **FRIEDLEY-VOSHARDT ART METAL CEILINGS AND SIDE WALLS.** We have added to our list a great number of new and handsome designs. Special designs can be made if desired. Only the ***best*** of materials used. We are prepared to serve ***you.*** Ceiling Catalog No. 33 on request.

DONT DELAY—WRITE TODAY

FRIEDLEY-VOSHARDT CO.

Office: 733-737 S. Halsted St. **Factory:** 761-771 Mather Street

CHICAGO, ILLINOIS

AREX

Send For These Advertisements

Arex Ventilators are known in every industry—thousands of dollars are spent every month telling executives about them. You can attach a set of these ads when you bill your next job—the man will be pleased to know you have given the best.

AREX COMPANY

J. C. Kerschen, Pres.

1581 Conway Building, Chicago

THE ORIGINAL SIPHONAGE VENTILATOR

Terne Plate Specialists

since the beginning of the industry in this country

Let us quote on your requirements.

THE J. M. & L. A. OSBORN COMPANY, ***Cleveland***

Sheet Metal Workers' and Furnacemen's Supplies

Make money by making sluggish chimneys work right with

IWANS' VOLCANO REVOLVING CHIMNEY TOP

NOTICE from the illustration how the Volcano creates draft—the lower curved section of the hood is the deflector. The wind blowing through this opening diagonally upward past the chimney opening draws the air in the chimney thereby creating a continuous draft.

Vane, Hood and Deflector Patterns—FREE

Order Volcano Iron Mountings, they cost little, get patterns free and make hoods in your own shop.

The Volcano Iron Mountings are simple, made in two parts and are strong and very easy-swinging, permitting the hood to revolve in slightest breeze.

Order Volcano Mountings or complete tops today and start getting real profits—write for circulars and prices.

IWAN BROTHERS SOUTH BEND, IND.

Manufacturers of Hardware Specialties

C. G. HUSSEY & CO.

Rolling Mills and Office, PITTSBURGH, PA.

Manufacturers of

SHEET COPPER, BOTTOMS, ROLL COPPER, TINNED AND POLISHED COPPER, NAILS, SPIKES, RIVETS, CONDUCTOR PIPE, EAVES TROUGH, ELBOWS, SHOES, MITRES, ETC.

Branch Warehouses in New York, Chicago and St. Louis

REQUIRES ONLY HEAT

CHICAGO SOLDER COMPANY

4201 Wrightwood Ave., CHICAGO, ILL.

PATTERNS—CHARTS

Elbow Patterns, Patterns for complete line of Tinware, Skylight Patterns and Block Letter and Figuring Patterns, Furnace Boot, Ventilator, Register Box, Liquid Measure and other Patterns, all listed and described in our 10-page book catalog.

Write for Your Copy Today

AMERICAN ARTISAN AND HARDWARE RECORD

630 South Michigan Avenue Chicago, Ill.

Plecker's Galvanized Eave Trough and Corrugated Expanding Conductors

Made of Keystone Copper Bearing Steel

Costs no more Lasts Longer Therefore Cheaper.

CLARK-SMITH HARDWARE CO. **PEORIA, ILLINOIS**

"THE STANDARD"

VENTILATOR and CHIMNEY CAP

DOES away with high stacks, swings freely in the slightest breeze and positively cures down-drafts. The strongest and most efficient combination to be had. Has no equal for chimney purposes. All jobbers sell them—write your jobber or us for prices and catalog today.

Manufactured by

STANDARD VENTILATOR CO.

LEWISBURG, PA.

Uniform, Collar Adjustable.

	Doz.
5-inch	$2 00
6-inch	2 10
7-inch	2 60

WOOD FACES—50% off list.

FENCE.

Field Fence	60%
Lawn "	53%

FILES AND RASPS.

Heller's (American)	65-5%
American	60-5%
Arcade	60 & 10%
Black Diamond	50-5%
Eagle	60-10%
Great Western	60 & 10%
Kearney & Foot	60 & 10%
McClellan	60 & 10%
Nicholson	50-14%
Simonds	60%

FIRE POTS.

Ashton Mfg. Co.
Complete line Firepots and Torches....52%

Otto Bernz Co.

No. 1 Furn. Gasolene with large shield, 1 gal.	$ 6 75
No. B Furn. Kerosene, 1 gal.	15 12
No. 10 Brazier, Kerosene or Gasolene, 10 gals.	47 52
No. 5 Torch, Gasolene or Kerosene, 1 pt.	7 92
No. 83 Torch, Gasolene, 1 quart	5 40
No. 86 Torch, Gasolene, 1 pt.	4 05

Clayton & Lambert's.
East of west boundary line of Province of Manitoba, Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma, Amarillo, San Angelo and Laredo, Texas 52%
West of above boundary line.48%

Geo. W. Diener Mfg. Co.

	Ea.
No. 02 Gasolene Torch, 1 qt.	$ 5 55
No. 0250, Kerosene or Gasolene Torch, 1 qt.	7 50
No. 10 Tinners' Furn. Square tank, 1 gal.	12 60
No. 15 Tinners' Furn. Round tank, 1 gal.	12 00
No. 21 Gas Soldering Furnace	3 60
No. 110 Automatic Gas Soldering Furnace	10 50

Double Blast Mfg. Co.
Gasolene, Nos. 25 and 35...60%

Quick Meal Stove Co.
Vesuvius, F.O.B. St. Louis 30%
(Extra Disct. for large quantities)

Chas. A. Hones, Inc.

Buzzer No. 1	$ 9 00
" " 2	12 00
" " 22	13 50
" " 42	15 00
" " 43	19 00

FREEZERS—ICE CREAM.

Peerless and Alaska

1 quart	$2 95
2 quart	3 45
3 quart	4 10

White Mountain

½ quart	$3 50
1 quart	4 90
2 quart	5 70

GALVANIZED WARE.

Pails (Competition), 8 qt.	$1 85
10-qt.	2 10
12-qt.	2 30
14-qt.	2 57
Wash tubs, No. 1	$6 25
No. 2	7 00
No. 3	8 25

GARAGE DOOR HARDWARE.

Stanley ..... All net

GAUGES.

Marking, Mortise, etc. ..... Nets

Wire.
Disston's 25%

GIMLETS.

Discount ..... 65% and 10%

GLASS.

Single Strength, A and B, all sizes ..... 83 & 85%
Double Strength, A, all sizes 84%

GREASE, AXLE.

Frazers'

1-lb. tins, 36 to case, per case	$ 4 70
3-lb. tins, 24 to case, per case	7 80
5-lb. tins, 12 to case per case	7 20
10-lb. tins, per dozen	10 40
15-lb. tins, per dozen	13 80
25-lb. tins, per dozen	19 80

HAMMERS, HANDLED.

All V. and B.

	Each, net
Blacksmiths' Hand, No. 0, 26-oz.	$1 00
Engineers' No. 1, 26 oz.	1 00
Farrier's, No. 7, 7-oz.	93
Machinists', No. 1, 7-oz.	78

Nail.

Vanadium, No. 41, 20-oz. each	1 59
Vanadium, No. 41½, 16-oz. each	1 59
V. & B., No. 11½, 16-oz., each	1 01
Garden City, No. 111½, 16-oz., each	75

Tinner's Riveting, No. 1, 8-oz., each 79

Shoe, Steel, No. 1, 18-oz., each 65

Tack.
Magnetic.
No. 5, 4-oz., each 81

HAMMERS, HEAVY.

Farrier's, No. 10, 10-oz. ...$1 01

HANDLES.

Axe.

Hickory, No. 1....per doz.	4 00
Hickory, No. 2.... "	3 00
1st quality, second growth	6 00
Special white, 2nd growth	5 00

Chisel.

Hickory, Tanged, Firmer assorted .....per doz.	55c
Hickory, Socket, Firmer, Assorted .....per doz.	70c

File .....per doz. $1 20

Hammer and Hatchet.

No. 1 per doz.	$0 90
Second Growth hickory, per doz.	1 50

Soldering.
Per doz. $2 40

HANGERS.

Conductor Pipe.
Milcor Perfection Wire....25%

Eaves Trough.

Steel hangers	30%
Triple Twist wire	10%
Milcor Eclipse Wire	20%
Milcor Triplex Wire	15%
Milcor Milwaukee Extension	15%
Milcor Steel (galv. after forming) List plus	12½%
Milcor Selflock E. T. Wire, List plus	40%

HASPS.

Hinge, Wrought, with staples. Net

HATCHETS.

V. and B. Supersteel.

	Each
Broad, No. 1, 24-oz.	$1 43
Half, No. 1, 15-oz.	1 25
Half, No. 3, 27-oz.	1 37
Claw, No. 1, 19-oz.	1 31
Flooring, No. 1, 20-oz.	1 43
Shingling, No. 1, 17-oz.	1 20
Lathing, No. 1, 14-oz.	1 20
Lathing, No. 2, 17-oz.	1 25

Vanadium Steel.

Half, No. 62, 22-oz.	$1 82
Underhill Pattern Lathing, 9 row, 19-oz.	2 29

HINGES.

Heavy Strap, in Bundles.

4 inch, dozen prs.	$1 12
5 " " "	1 57
6 " " "	1 93
8 " " "	3 21

Extra Heavy T in Bundles.

4 inch, dozen prs.	$1 74
5 " " "	1 85
6 " " "	2 31
8 " " "	3 95

HOES.

Garden ..... Net

HOOKS.

Box.
V. and B. No. 9, each....$0 26

Conductor.
Milcor .....
"Direct Drive" Wrought Iron for wood or brick 15%

Cotton.
V. and B. No. 8, each... 24

Hay.
V. and B. No. 1, each.. 26

Bar Meat.

V. and B. No. 26, ⅜", each	09
V. and B. No. 28, ½", each	16

Screw Meat.
V. and B. No. 2, per gro. 6 50

Butchers' "S."

V. and B. No. 6, each..	08
V. and B. No. 8, each..	11

HOSE.

	Per Ft.
⅝-in. 2 ply molded	9½c. to 12¾c
⅝-in. cord	8½c to 10c
¾-in. wrapped	13½c

HUMIDIFIERS.

"Front-Rank," Automatic.

In single lots	50%
In lots of 10 or more	50-5%
In lots of 25 or more	50-10%
Vapor pans, etc., each	50%

IRONS.

Sad.

Genuine Mrs. Potts, nickel plated, per set	$1 55
Asbestos No. 70, per set.	2 10
Asbestos No. 100, per set.	2 30

E. C. Stearns'.

No. OA Corner, doz. sets.	$2 50
No. OB " " "	2 75

KNIVES.

Butcher.

Beechwood Handles, 6-inch blade	25%
Beechwood Handles, 7-inch blade	25%
Beechwood Handles, 3-inch blade	25%

Cooper's Hoop 25%

Drawing.

Standard	25%
Adjustable	25%
Barton's Carpenters'	25%

Hay.

Iwan's Solid Socket	25%
Heath's	25%
Iwan's Sickle Edge	25%
Iwan's Imp'd Serrated	25%

Hedge.

Challenge	25%
Disston's No. 1	25%

Putty.

Common	25%
Lander's	25%

Scraping.

Beech Handles	25%
Lander's	25%

KNOBS.

Door.

Mineral .....per doz.	$2 00
Porcelain "	2 00
Jet "	2 00

LADDERS.

Step.

Common, per ft.	28c
Common, with Shelf, add	10c
IXL	34c
Challenge, 6 to 9 ft.	55c
10 to 16 ft.	60c
Kant-Break, per lineal ft.	75c

LANTERNS.

	Per doz.
Monarch tin, hot blast	$ 8 25
Dietz No. 2 cold blast	13 00
Best tubular	8 25
Competition lanterns No. 0 tubular	6 90

LAWN MOWERS.

12-inch	$5 20
16-inch	5 85

Ball Bearing.
4 blade, adjustable bearing.

14"	$5 20
16"	7 80

LEATHER BELTING.

From No. 1 Oak Tanned Butts.

Extra heavy, 18-oz.	35%
Heavy, 16-oz.	40%
Medium, 14½-oz.	40%
Light, 13-oz.	50%

LEATHER LACING.

Cut, strictly No. 1 ..... 45%

LEVELS.

Disston, No. 28 Asst.	$22 05
" No. 18, 20 in., each	1 88
" No. 22, 24 in., each	2 40
" Shafting, 6 in.	19 80
" " 6 in. gr. glass	24 20
" No. 1 Asst.	5 75
" No. 2 Asst.	12 40
" 24-26 in., each	1 02
" 28-30 in., each	1 00

LIFTERS.

Stove Cover.

Coppered .....per gro.	$6 00
Alaska "	4 75

LOCKS.

Barn Door.

No. 60 Stearn's..per doz.	$11 00
No. 80 " "	20 00

MALLETS.

Carpenters'.

Fibre Head No. 2, per doz.	$12 00
" No. 3, "	15 50
" No. 3½, "	20 50
Round Hickory, per .....doz.	$3 00— 5 00

Tinners'.
Hickory .....per doz. $2 25

MATS.

Door.
National Rigid.....5 & 10 & 5%
Acme Steel Flexible.....50%

MITRES.

Galvanized steel mitres, and caps, end pieces, outlets...30%
Milcor .....
Galv. one piece stamped.....40%

MOPS.

Cotton, Star (Cut Ends).
Pounds 12' 15' 18' 24'-3-oz.
Per doz. $4 00 4 35 5 50 7 00
Enterprise 16⅔%
Parker .....50 & 5%

NAILS.

Cut Steel	$4 70
Cut Iron	4 70

Wire.

Common	3 30
Cement Coated	3 40

NETTING, POULTRY.

Galvanized before weaving 45-10%
Galvanized after weaving 45%

NIPPERS.

Nail Cutting.
V. & B. No. 30.....73c

Double Duty.
V. & B. No. 60.....76c

Hoof.
Heller's .....40 & 10%
V. & B. No. 52, each.....$2 25

NOZZLES.

Hose.

Diamond	" 5 75
Magic .....per doz.	$9 50

OILERS.

Chase Pattern.
Brass and Copper.....10%
Zinc Plated .....40 & 5%

Railroad.
Brass .....20 & 5%
Coppered .....50 & 5%

Steel.
Copper Plated .....70 & 5%

OPENERS.

Delmonico .....per doz.	$1 30
Never Slip..... "	60

Crate.
V. & B...per doz. $7 25—11 00

The Accountant

—the man who knows the most about a Business

IN every business the accountant or the auditor, who must be an accountant first, is the man with his hand on the pulse of the business. He is the man who can tell whether or not a business is making money, where the leaks are, who, in short, is the man to whom the heads of the firm must come if they are to keep themselves informed of the condition of their affairs.

Such a man is sought. He does not seek the confidence of his employers—they come to him. He possesses knowledge that is confidential and it is knowledge furthermore that he has created.

An accountant is an essential figure in a business that is worthy of employing more than one bookkeeper.

Accountants have opportunities presented to them for becoming members of the firm, because it is highly desirable that a man with an accountancy training be one of those most interested in the financial welfare of a business.

The National Institute of Accountancy Course in Business and Professional Accountancy prepares a man primarily for the job of Accountant, Auditor, Treasurer, etc., We can qualify you for bigger things in the business world, after that it is up to you to go as much farther as you will.

NATIONAL INSTITUTE OF ACCOUNTANCY, Inc.

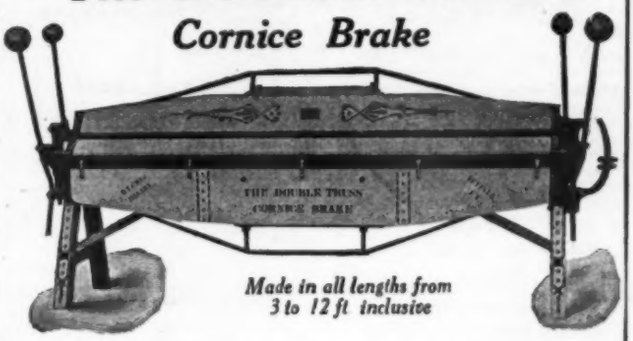
(Formerly a department of Blackstone Institute)

48th and Grand Blvd. CHICAGO, ILL.

Save **TIME, WORK, MONEY,** *Use*

The DOUBLE TRUSS

Cornice Brake



Made in all lengths from 3 to 12 ft inclusive

Over 25 years on the market

Thousands in use today

Here is a Cornice Brake that is constructed and designed to do your work, better, quicker and more accurately.

Two grades and all sizes in stock.

The Double Truss Cornice Brake is light, strong and costs less than other brakes.

Write today for prices and further details on this brake and the Electric City gutter former. Your jobber can supply you or we can ship immediately from stock.

FORMING MACHINE CORPORATION

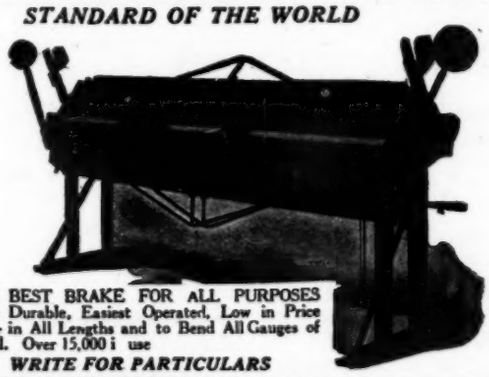
Successors to **Double Truss Cornice Brake Co.**

35 Chandler St. Buffalo, N. Y.

W. B. Topp, Snyder—Agent for Australia and New Zealand

CHICAGO STEEL CORNICE BRAKES

STANDARD OF THE WORLD



THE BEST BRAKE FOR ALL PURPOSES
Most Durable, Easiest Operated, Low in Price
Made in All Lengths and to Bend All Gauges of Metal. Over 15,000 in use

WRITE FOR PARTICULARS

DREIS & KRUMP MFG. CO., 2915 S. Halsted Street, CHICAGO

WIRE

electrical, rope, barbed, plain, nails, tacks, spikes, bale-ties, hoops, springs, netting, wire fences, steel posts, steel gates, trolley wire, rail bonds, flat wire (strip steel), piano wire, horse shoes, round and odd-shape wire, screw stock concrete reinforcement. Aerial Tramways.

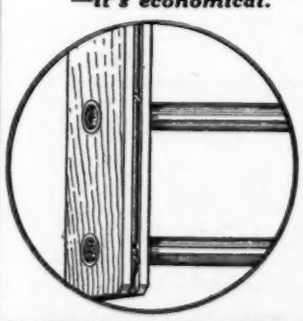
Illustrated Books describing uses, Free

American Steel & Wire

Chicago—New York **Company**

LOOK AT THIS—10 men, 1,690 pounds on this KANT-BREAK STAGE

You should use this safe durable stage —it's economical.



THERE'S a ¼-inch steel rod through the center of each rung firmly bolted to the sides.

There's a No. 7 Bessemer tinned steel wire grooved in on both sides of the rails, countersunk at both ends.

It's the only stage of its kind on the market—order yours now.

Write today for prices and circulars.

KANT-BREAK LADDERS, Inc., - Ninth and Monroe Streets - ST. LOUIS, MISSOURI

PAILS.

Cream.
14-qt. with gauge, ...per doz. $9 50
18-qt. without gauge, ...per doz. 11 00
20-qt. without gauge, ...per doz. 11 75

Sap.
10-qt., IC Tin....per doz. $4 00
12- " " " " 5 50

Stock.
Galv. qts. 14 16 18 20
Per doz. $9 75 10 75 12 75 14 50

Water.
Galvanized qts. 10 12 14
Per doz. $5 75 6 50 7 25

PASTE.

Asbestos Dry Paste:
200-lb. barrel $15 00
100-lb. barrel 8 00
35-lb. pail 3 25
10-lb. bag 1 00
5-lb. bag 55
2½-lb. cartons 30

PINCERS.

All V. & B.
Carpenters', cast steel, No. ... 6 8 10 12
Each $0 43 $0 52 $0 61 $0 71
Blacksmiths', No. 10.....$0 64

PIPE.

Conductor

"Interlock" Galvanized.
Crated and nested (all gauges) 60-20%
Crated and not nested (all gauges) 60-15%
Square Corrugated A and B and Octagon.
29 Gauge 60-10%
28 " 60-10%
26 " 60-10%
24 " 60-10%

"Interlock."
Crated and nested (all gauges 60-20%

Prices for Galvanized Toncan Metal, Genuine O. H. Iron, Lyonmore Metal and Keystone C. B. on application.

Stove. **Per 100 joints**
26 gauge, 5 inch E. C. nested $17 00
26 gauge, 6 inch E. C. nested 17 00
26 gauge, 7 inch E. C. nested 19 00
28 gauge, 5 inch E. C. nested 14 00
28 gauge, 6 inch E. C. nested 15 00
28 gauge, 7 inch E. C. nested 17 00
30 gauge, 5 inch E. C. nested 13 00
30 gauge, 6 inch E. C. nested 13 00
30 gauge, 7 inch E. C. nested 15 00
T-Joint Made up, 6-inch .....per 100 35 00

Furnace Pipe.
Double Wall Pipe and Fittings 40-10%
Single Wall Pipe, Round Pipe Fittings 40-10%
Galvanized and Black Iron Pipe, Shoes, etc..40-10%
Milcor Galvanized 40%

PLANES.

Stanley Iron Bench.....Net

PLIERS.

(V. & B.)
Nut, No. 3, each.....$2 60
" No. 5, each..... 64
" No. 25, each..... 69

Gas, No. 7, each..... 55
" No. 8, each..... 61
" No. 12, each..... 87

Lining or Crimping.
No. 35, each 64

Button's Pattern.
No. 6 each..... 61
No. 8 each..... 74

Double Duty, No. 106..... 50

POINTS, GLAZIERS'.

No. 1,2 and 3..per doz. pkgs. 65c

POKERS, STOVE.

Wr't Steel, str't or bent, ...per doz. $0 75
Nickel Plated, coil handles ..... " 1 10

POKERS, FURNACE.

Each $0 50

PULLEYS.

Furnace Tackle....per doz. $0 60
per gross 6 00
" Screw (encased)....per doz. $0 85

Ventilating Register.
Per gross $9 00
Small, per pair..... 0 30
Large, per pair..... 0 50

PUNCHES.

Machine. **Each**
V. & B., No. 11-13, 1½x6..$0 19
V. & B., No. 90, ⅝x9..... 27
V. & B., No. 10, ¾x10.... 29
V. & B., No. 1-6, ½x6..... 12

Center.
V. & B., No. 50, ⅜x4.....$0 14

Belt.
V. & B., No. 101-103.....$0 24
V. & B. No. 25, ass't..... 3 80
V. & B., No| 25, ass't..... 3 80

Samson Line.
No. 1 Hand { Doz. lots or less 40%
No. 2 Hand { 3 doz. lots ...Less 40 & 5%
No. 4 Hand { 6 doz. lots or more ..Less 50%
No. 3 Bench { Less than doz. lots... Less 25%
{ Doz. lots or more...Less 40%

Extra Punches and Dies for Samson:
No. 1 Hand { Less than doz. lots...Less 25%
No. 2 Hand { Doz. lots, ...Less 33⅓%
No. 4 Hand { 3 doz. lots, ...Less 40%
No. 3 Bench { 6 doz. lots or more, ..Less 40 & 10%

PUTTY.

Commercial Putty, 100-lb. kits $3 55

QUADRANTS.

Malleable Iron Damper.....10%

FLOOR REGISTERS AND BORDERS.

Cast Iron 25%
Steel and Semi-Steel.....40%
Baseboard 40%
Adjustable Ceiling Ventilators 40%

Register Faces—Cast and Steel
Japanned, Bronzed and Plated, 4x6 to 14x14.....40%
Large Register Faces—Cast, 14x14 to 38x42.....60%
Large Register Faces—Steel, 14x14 to 38x42.....65%

ROOFING.

Per Square
Best grade, slate surf. prep'd$1 85
Best talc surfaced..... 2 20
Medium talc surfaced..... 1 50
Light talc surfaced..... 95
Red Rosin Sheeting, per ton $72 00

ROPE.

Cotton.

Sisal.
1st Quality, base.....13½c
No. 2 .....12½c

Manila.
1st Quality standard brands 15½c
No. 2 .....14½c
Hardware Grade, per lb....12½c

SAWS.

Butchers'.
Atkins No. 2, 14-in.....$12 75
" No. 2, 18-in..... 14 30
" No. 7, 16-in..... 15 85
" No. 2, 22-in..... 15 92
" No. 7, 20-in..... 18 05
" No. 7, 24-in..... 20 20
" No. 7, 28-in..... 22 35

Compass.
Atkins No. 2, 10-in.....$ 5 45
" No. 10, 10-in..... 5 60
" Blades, No. 2, 10-in 3 25
" " No. 2, 10-in. 3 30

Cross-Cut.
Atkins No. 221, 4-ft.....$3 03
" No. 221, 6-ft..... 4 45
" No. 221, 8-ft..... 6 07

Hand.
Copper Burrs only.....30%
" No. 96, 20-in..... 21 70

Hand and Rip.
Atkins No. 54, 20-in.....$19 50
" No. 54, 26-in..... 24 40
" No. 53, 16-in..... 18 10
" No. 53, 20-in..... 22 90
" No. 53, 24-in..... 26 60
" No. 53, 28-in..... 31 45
" No. 53, 30-in..... 34 15

Keyhole.
Atkins No. 1 complete.....$3 10
" No. 2 complete..... 3 70

Miter Box.
Atkins No. 1, 4x20.....$32 65
" No. 1, 5x22..... 38 00
" No. 1, 6x22..... 42 20

Pruning.
Atkins No. 20, 12-in.....$ 8 45
" No. 10, 16-in..... 18 15

Wood.
Atkins No. 202.....$ 7 19
" No. 318..... 8 75
" No. 906..... 15 50
" No. 1509..... 16 56

SCRAPERS.

Box.
No. 6, six blades each.....25c

Hog.
No. 6, each 25c

Floor (Stearns).
No. 10, each.....$11 50

SCREEN DOOR HINGES.

Cast Iron .....gross $13 00
Steel ..... " 9 50

SCREWS.

Wood.
F. H. Bright.....80%
R. H. Blued.....78%
F. H. Jap'd.....74%
F. H. Brass.....76%
R. H. Brass.....74%

Sheet Metal.
No. 7, ½x ⅛, per gross$0 55
No. 10, ¾x3/16, per gross 75
No. 14, ⅞x ¼, per gross 90

SCREW DRIVERS.

Uncle Sam Standard Head.
2 inches, each.....$ 45
5 inches, each..... 52
8 inches, each..... 68
12 inches, each..... 1 02

Uncle Sam Insulated Head.
3 inches, each.....$ 49
5 inches, each..... 57
8 inches, each..... 76
12 inches, each..... 1 14

SETS.

Nail.
V. & B.
No. 100, in cardboard boxes .....doz. $1 55
No. 100, in wooden boxes, ... doz. 1 58
No. 30, assorted.....doz. 39
No. 5, in cardboard boxes, ... doz. 1 25
No. 5, in wooden boxes, ... doz. 1 30

Rivet.
V. & B.
Farmers' $0 15
Tinners' 3-4..... 0 40
" 00-0..... 0 60

Saw.
Atkins No. 10....per doz.$3 80
" No. 12.... " 6 20

SHEARS.

Per Doz.
Nickel Plated, Straight, 6" $12 90
" " " 7" 14 85
" " " 8" 16 80
Japanned, Straight, ...6" 11 00
" " .....7" 12 40
" " .....8" 13 80

SHEARS, TINNERS' & MACHINISTS'.

Viking $22 00

Lennox Throatless.
No. 18 .....35%
Shear blades 10%
(f.o.b. Marshalltown, Iowa.)

Peerless Steel Squaring.
Foot Power.
No. 1—30", 18 ga. cap.....15%
No. 2—36", 18 ga. cap.....15%
No. 4—52", 18 ga. cap.....15%
No. 10—120", 22 ga. cap...15%
No. 4A—52", 16 ga. cap....15%

Cast Iron Foot Power.
No. 01, 30", 18 ga. cap.....15%

Power Driven.
(No. 100 Series, 2 Shaft Drive.)
No. 142—42", 18 ga. cap...15%
(No. 200 Series, 2 Shaft Underneath Drive.)
No. 242—42", 14 ga. cap...15%
(No. 300 Series, 3 Shaft Underneath Drive.)
No. 342—42", 10 ga. cap...15%
No. 372—72", 10 ga. cap...15%
(No. 500 Series, 3 Shaft Underneath Drive.)
No. 596—96", 10 ga. cap...15%
No. 600 Series, 3 Shaft Underneath Drive.)
No. 6120—120", 3/16" cap.15%

SHINGLES.

Per Square
Zinc (Illinois) $18 00

SHOES.

Milcor.
Galv. Std..Gauge, Plain or corg. round flat crimp...65%
26 gauge round flat crimp...40%
24 gauge round flat crimp...10%
Conductor 65%

SHOVELS AND SPADES.

Coal.
Hubbard's.

No.	A	B	C	D
1	$16 00	15 10	14 45	13 70
2	16 35	15 60	14 85	14 10
3	16 75	16 00	16 25	14 40
4	17 10	16 35	16 60	14 85

Post Drains & Ditching.
Hubbard's.

Size	A	B	C
14"	$17 15	$16 40	$15 65
16"	17 50	16 75	16 00
18"	17 85	17 10	16 35
20"	18 20	17 45	16 70
22"	18 55	17 80	17 05

Alaska Steel.
D-Handle .....per doz. $3 50
Long Handle ..... " 3 00

SIFTERS.

Genuine Hunters, doz.....$2 50

SKATES.

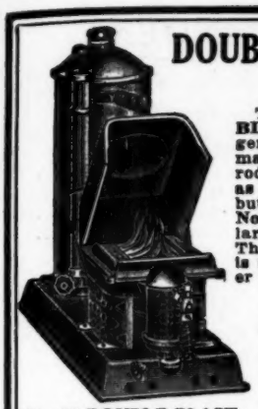
Ice, Men's and Boys'. Per Pair
Key Clamp—rocker—bright finish .....$ 76
Key Clamp—rocker—nickel finish 1 10
Kay Clamp—rocker — polsteel 1 36
Kay Clamp—rocker — pol. Skate outfits 4 75

Women's and Girls'.
½" Key Clamp—rocker....$1 31
" " " hockey.. 1 38
Ice Skate outfit..... 5 00

Roller.
Ball Bearing—Boys' $1 55
Ball Bearing—Girls' 1 65

DOUBLE BLAST FIRE POTS

Gasoline Burning



The **GENERATOR** used in **DOUBLE BLAST FIRE POTS** is the most powerful generator ever put on a fire pot. It is made of brass and will not rust or corrode. It has no packing of any kind, and as it has no small channels it cannot clog but will always burn a blue flame. Our **No. 25 Fire Pot** shown herewith has a large brass pump one inch in diameter. The tank is made of galvanized steel and is firmly fastened to the base. The burner on this fire pot is so arranged that the two hot blasts are forced from the outside to the center so that the iron in the fire receives both hot blasts. There are more features that you should know about.

Our latest catalog discribes our line in full. Write for it today.

No. 25 DOUBLE BLAST Tinners' Fire Pot

DOUBLE BLAST MFG. CO.
NORTH CHICAGO, ILL.

THREE PIECE COIL CUP

FITS GROOVE IN TOP PLATE

Patented

No. 22 Fire Pot
Ask for Latest Price

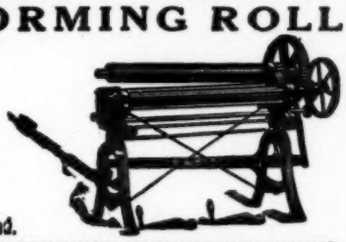
OUR LATEST ACHIEVEMENT

No. 22 has all good points found in other Coil Fire Pots and our latest patented improvements. Rust proof steel tank, heavy uprights, brass fittings, strong valve, powerful pump and large funnel and filler plug. Top section is easily removed. There are no coil cup lugs or nuts to burn off. Jobbers supply at factory prices. Write for a catalogue.

CLAYTON & LAMBERT MFG. CO.
10635 Knodell Avenue
DETROIT, MICH., U. S. A.

50-INCH FORMING ROLL

This Forming Roll is built in all standard sizes, with our Patented Opening Device by means of which it is opened and closed in a few seconds.



We build a complete line of Shears and Punches, all sizes, for hand or belt power

Write for Catalog "R"

BERTSCH & CO., Cambridge City, Ind.

This Week and Every Week

You'll find in the pages of AMERICAN ARTISAN and HARDWARE RECORD *regular weekly departments* and *special articles* or *sales stories* which help you in a practical way to increase the profits of your businsess.

VESUVIUS

Blow Torches and Stoves

For Gasoline

have an extremely powerful flame. They are made of the best material that can be obtained and their construction insures long serviceability.

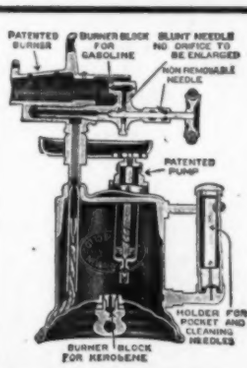
Write for Descriptive Circular Today

For Coaloil

QUICK MEAL STOVE CO.
Div. American Stove Company
825 Chouteau Avenue St. Louis, Mo.

YOU have the right to expect unvarying performance in your Furnace. You will get it in Torrids.

Geo. W. Diener Mfg. Co., Chicago, Ill.


PATENTED BURNER
BURNER BLOCK FOR GASOLINE
BLUNT NEEDLE NO ORIFICE TO BE ENLARGED
NON REMOVABLE NEEDLE
PATENTED PUMP
HOLDER FOR POCKET AND CLEANING NEEDLES
BURNER BLOCK FOR KEROSENE

PREPARE FOR COLD WEATHER

Look over your stock of TORCHES AND FURNACES NOW. If it is not complete, place an order AT ONCE so you will have the tools on hand when your customers need them

You should purchase some reliable make so your customers can obtain satisfactory results. Order the "ALWAYS RELIABLE torches and furnaces which are practica economical, and durable.

PATENTED—No. 79 Torch, Quart.
No. 80 Torch, Pint.
Gasoline-kerosene with removable hook

Jobbers can supply at factory prices.

OTTO BERNZ CO., INC., NEWARK, N.J.
Established 1876.
Manufacturers of Torches, Furnaces and Plumbers' Tools

SNIPS, TINNERS'.

Clover Leaf .....40 & 10%
National .....40 & 10%
Star 50%
Milcor .....Net

SQUARES.

Steel and Iron .....Net
(Add for bluing, $3.00 per doz. net.)
Mitre ..... "
Try ..... "
Try and Bevel ..... "
Try and Mitre ..... "
Fox's .....per doz. $6 00
Winterbottom's 10%

STAPLES.

Blind.
Barbed .....per lb. 21c@22c
Butter, Tub..... " 16@19c
Fence—
Polished .....per 100 lbs. $5 45
Galvanized ... " 6 15
Netting.
Galvanized ..per 100 lbs. $6 54
Wrought.
Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples .....50 & 10%
Extra heavy 35%

STONES.

Axe.

Hindustan	....per lb.	New Nets
More Grite	..... "	"
Washita	..... "	"

Emery.

No. 126	.....per doz.	New Nets

Oil Mounted.

Arkansas Hard No. 7	.....per doz.	New Nets
Arkansas Soft...	"	"
Washita No. 717	"	"

Oil—Unmounted.

Arkansas Hard	per lb.	New Nets
Arkansas Soft	"	"
Lily White.....	"	"
Queer Creek.....	"	"
Washita	"	"

Scythe.

Black Diamond	per gro.	New Nets
Crescent	"	"
Green Mountain.	"	"
LaMolle	"	"
Extra Quinine bog	"	"
Red End	"	"

STOPS, BENCH.

No. 10 Morrill pattern .....per doz. $11 00
No. 11 Stearns pat tern ..... " 10 00
No. 15 Smith pattern ..... " 7 00

STOPPERS, FLUE.

Common .....per doz $1 10
Gem, No. 1..... " 1 10
Gem, flat, No. 3.... " 1 00

STRETCHERS.

Carpet.

Bullard's	.....per doz.	$3 90
Excelsior	"	5 25
Malleable Iron ...	"	70
Perfection.....	"	6 30
King	"	4 50

Wire.

O. S. Elwood, No. 1	per doz.	Nets
O. S. Elwood, No. 2	"	"

SWIVELS.

Malleable Iron .....per lb. $0 10
Wrought Steel ....per gro. $4 50

TACKS.

Bill Posters' 6-oz., 25-lb. boxes, per lb.....15c
Upholsterers' 6-oz., 25 lb... ooxes, per lb.....15½c

TAPES, MEASURING.

Asses' Skin .....List & 40%

THERMOMETERS.

Tin Case....per doz 80c & $ 1 25
Wood Backs " 2 00 & 12 00
Glass ..... " 12 00

TIES.

Bale.
Single Loop, carload lots .....75 & 7½
Single Loop, less than car lots .....70 & 15%

TRAPS.

Mouse and Rat.	Per Gross
Sure Catch Mouse Traps.	$ 2 50
Vim Mouse Traps.....	2 50
Short Stop Mouse Traps.	2 40
Wood Choker Mouse Traps, 4 hole.....	11 25

	Per Doz.
Sure Catch Rat Traps....	$ 0 85
Dead Easy Rat Traps....	0 90

Packed in One Bushel Band Stave Baskets.

	List per Bushel
Sure Catch Mouse Traps (360 Traps)	$ 6 25
Short Stop Mouse Traps (360 Traps)	6 00
Sure Catch Rat Traps (54 Traps)	3 90
Short Stop Rat Traps (54 Traps)	3 75

Assorted Mouse and Rat Traps.

	List per Bushel.
Sure Catch (216 Mouse Traps and 26 Rat Traps)	$5 65
Short Stop (216 Mouse Traps and 26 Rat Traps)	5 40

TROWELS.

Cement.

Atkins No. 6.....	$19 50
" No. 9.....	25 50

TWINE.

White Cotton.
Eureka, 4-ply .....per lb. 30c
Jute.
Cattle Wire — Galvanized catch weight spool, per 3-ply and 6-ply Bale Lots 22½c

VALLEY.

Milcor .....
Galv. formed or roll.....60%

VENTILATORS.

Standard .....30 to 40%

VISES.

No. 700 Hand,			
Inches	4½	5	5½
Doz.	$11 15	13 00	14 85
No. 701. In.	4	5	6
Doz.	$11 15	13 00	16 70
No. 1, Genuine Wentworth, Noiseless Saw....per doz.			9 25
No. 3, Genuine Wentworth, Noiseless Saw..per doz.			12 75
No. 500, All Steel Folding Saw .....per doz.			16 00

WASHERS.

Over ½ in. barrel lots per 100 lbs. $6 25
Iron and Steel.

In.	5/16	⅜	½	⅝	¾
	10¼c	9¼c	7¾c	7½c	7 2/5c

WEATHER STRIPS.

Metallic Stitched.
½ in., per 100 ft.....$1 80
¾ in., per 100 ft..... 2 20
Wood and Felt.
⅝ in., per 100 ft.....$1 56
⅞ in., per 100 ft..... 1 56

WEIGHTS.

Hitching per lb. Nets
Sash—f. o. b. Chicago
Smaller lots, per ton....$47 50

WHEEL BARROWS.

Common Wood Tray.....$3 75
Steel Tray, Competition.... 4 50
Steel leg, garden 6 00

WIRE.

Plain annealed wire, No. 8 per 100 lbs. $3 70
Galvanized barb wire, per 100 lbs. 4 10
Wire cloth — Black painted, 12-mesh, per 100 sq. ft.... 2 35
Cattle Wire—galvanized catch weight spool, per 100 lbs. 4 60
Galvanized Hog Wire, 80 rod spool, per spool..... 3 98
Galvanized plain wire, No. 9, per 100 lbs..... 4 15
Stove Pipe, per stone..... 1 10

WOOD FACES.

50% off list.

WRENCHES.

Coes Steel Handle,	6-in...	40-10%
" " "	8-in...	40-10%
" " "	10-in...	40-10%
" " "	12-in...	40-10%
Coes Knife-Handle,	6-in..	40-10%
" " "	8-in..	40-10%
" " "	10-in..	40-10%
" " "	12-in..	40-10%
Coes All Patterns.....		40-10%

WRINGERS.

No. 790, Guarantee	per doz.	$55 50
No. 770, Bicycle	"	52 50
No. 670, Domestic	"	48 50
No. 110, Brighton	"	43 50
No. 750, Guarantee	"	55 50
No. 740, Bicycle	"	52 50
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